HOME ENVIRONMENT AND READING ATTAINMENT: A STUDY OF CHILDREN IN A WORKING CLASS COMMUNITY

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ABSTRACT. The relationship between a number of home background factors and reading ability was studied in three samples (Ns of 63, 100 and 104) of working class children aged 7-8, using standardised tests given to the children, and parental interviews. Home variables studied included the reading model provided by the mother, her educational aspirations, her language behaviour, the help she gave with reading at home, the disciplinary methods she employed, and the extent to which she supervised and participated in her child's out-of-school activities. The home background factor which emerged as most strongly related to reading achievement was whether or not the mother regularly heard the child read ('coached'). Most of the other significant relationships found between reading ability and parental practices could be accounted for by the fact that parents who displayed attitudes and practices which appeared to favour the development of reading ability in their children were also more likely to have the habit of hearing the child read. For example, controlling for coaching markedly reduced the correlation between maternal language behaviour (as assessed using scales devised by Bernstein's team) and reading performance: conversely, controlling for maternal language behaviour had little effect on the association between coaching and reading performance. WISC IQ scores were obtained on one of the samples (N = 100) and it was established that IQ differences did not account for the superior reading performance of the coached children. When the amount of coaching which the children had received was related to reading test score, a highly significant positive association was found. The lack of attention paid in the past to parental involvement in children's school work is commented upon in discussion of the theoretical and practical implications of the study findings.

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CHAPTER ONE

INTRODUCTION AND REVIEW OF LITERATURE

Social Class and School Achievement

The subject of this report is the relationship between social class and school achievement. In the 1950's and 60's, a series of Government Reports was published which revealed the persistence of a strong relationship between a pupil's social origin and his educational career, despite the removal of financial barriers to selective secondary education following the passage of the 1944 Education Act. It was at the same time established that neither crude material factors nor differences in the social distribution of measured intelligence could account for the observed differences in educational opportunity and the conclusion was reached that 'cultural' factors must therefore be responsible. The numerical findings of the various reports and the interpretations then placed upon them were summarized in papers presented to OECD[1] conferences in 1961 by Floud and 1965 by Westergaard and Little. (Floud 61, Westergaard & Little 67.)

Since that time, 'social class and educational attainment' has been the implicit or explicit subject of a stream of research projects, Government Reports and papers in academic and professional journals. At first glance, it might be thought that there was little left to say. In this

[1]Organisation for Economic Co-operation & Development.

report it is argued that, on the contrary, a great deal remains to be said because, when all the studies and reports have been read, it becomes apparent that very little is actually known about the central process in the social class and education relationship - that is, about the mechanisms by which parents, knowingly or unknowingly, influence those aspects of their children's behaviour which matter for success in school.

Social class, it has long been recognised, is not itself the cause of variations in school performance; rather, it serves as in index, a shorthand way of referring to a complex of factors which tend to be correlated with occupation. As Floud saw it, the problem was one of understanding how social class acted as "a profound influence on the educability of children," that is, as an influence on their responsiveness to school. (Floud 61.)

Aspects of the home environment which seemed likely to influence a child's responsiveness to school and which were at the same time related to father's occupation, were investigated in a great many studies, large and small. In two of the earliest of these, Floud et al 56 and Fraser 59 drew attention to the importance of cultural and motivational factors in the home environment, and the connection was firmly established when the report of the National Survey (Douglas 64) revealed that parental interest was a better predictor of children's school progress than was social class per se. The survey of parental attitudes and circumstances carried out for the Plowden Committee and published in its report (Central Advisory Council for Education 67) and the National Child Development Study

(Davie et al 72) produced further evidence of the importance of parental attidues and encouragement for children's school success and the role played by these variables in mediating the effect of social class.

Often studied alongside parental interest and aspirations were the 'cultural characteristics' of a child's home, usually as measured by the number of books in the house and whether or not the parents read newspapers or belonged to the public library. (See for example Sheldon & Carillo 52, Fraser 55, Pidgeon & Yates 59, Wiseman 67 and Cullen 69.)

Amongst other authors who have questioned social class per se as an educational influence, and who have considered cultural and motivational factors to be the most important intervening variables are Schonell 42, Malmquist 58, Mays 62, Morris 66 and Wilson 71.

Variations on the theme of class differences in parental attitudes and values may be found in the work of McClelland and of Rosen on the 'Achievement Motive' (McClelland et al 53, Rosen 56, Rosen et al 59), of Strodtbeck (Strodtbeck 58 and 65) and of Kohn (Kohn 58 and 59, Kohn and Carroll 60), while a more general sociological approach - asking how and why the class structure of society comes to be reflected in the educational attitudes and values of individuals - may be seen in the writings of Young (1965), Swift (1966 and 1967a),Banks (1968), Goldthorpe et al (1969) and Sugarman (1970).

In a number of the studies mentioned above, including the three national surveys, information was gathered on all three links in the suggested causal chain of social class membership, parental attitudes and children's attainments.

As well as demonstrating how parental attitudes mediated the social class effect, the data from these studies illustrated another, often ignored, fact very clearly: parental attitudes varied within, as well as between, social class groups. The attainment level of the children across social class groups showed a similar pattern: large differences between group means, but considerable overlap in the distributions - the spread - of scores from the various social class groups. Within each social class, the relationship between parental attitudes and children's achievement was found to be maintained. (See in particular Douglas 64.) To draw out a particular point, families existed which - by occupational criteria - belonged to 'working class' groups, but which, nonetheless, had educationally favourable attitudes and children who were successful in school.

Thinking about these findings, it seemed to the present writer that too little was known about educationally successful children from working class homes. This idea is expanded upon later in the report, when the themes which were drawn together in the planning of the present project are described in more detail.

In 1958, with the publishing of Bernstein's paper, 'Some sociological determinants of perception,' a new connection was suggested between social class and children's achievement, via the language behaviour of the parents and, subsequently, of the children themselves. Bernstein synthesised ideas from linguistics, sociology and psychology to produce an overall theoretical framework, the central ideas of which - presented in crude

summary - are as follows.

The class structure of society influences role relationships and structure within families. The nature of these role relationships in turn influences the content and also the form of the language used between family members. The language heard and then acquired by the growing child shapes his developing patterns of thought and, through them, his educability. Bernstein coined the terms 'elaborated and restricted codes' to describe the types of language characteristically used by middle and working class speakers respectively. A restricted code was described as one which, "orients its speakers to a less complex conceptual hierarchy and so to a lower order of causality." And further, "What is made available for learning through elaborated and restricted codes is radically different." - until eventually, "The social structure becomes the child's psychological reality through the shaping of his acts of speech." (Bernstein 1971.) This major, language induced, problem of educability is made worse by the 'cultural discontinuity' between home and school, and by the tendency for the most disadvantaged children to attend the poorest schools.

Bernstein's theories have been described and discussed in innumerable publications, with a book by Lawton (1968) being probably one of the most widely consulted as an introduction to the field.

A great deal of empirical work, much of it unfortunately of a low standard, has been carried out on the subject of social class differences in language behaviour. Lawton's book contains a review of work on such aspects of speech

as sentence complexity and length and the use of particular constructions, while members of Bernstein's own research team have looked at social class differences in mothers' 'patterns of communication and control,' as well as certain aspects of the speech of their children. (Brandis & Henderson 70, Robinson & Rackstraw 72, Cook 73, and collected papers in Bernstein 73.) In a number of studies by this team, the further step was taken of correlating measures of mothers' language behaviour (or other indices of her 'orientation to communication and control') with the tested IQ of their children. (Bernstein & Young 67, Brandis & Henderson 70, Cook 73.) Significant positive correlations were taken as evidence that mothers' reported orientations did have behavioural consequences for their children.

Discussion of 'the empirical exploration of Bernstein's hypothesis' is taken up again later. For the present, it is sufficient to note that, although there are many problems in interpreting the correlational findings mentioned above, at a purely descriptive level, the studies have provided valuable information on a number of aspects of children's home environment which vary within as well as between social class groups.

The Plowden Report

In 1963, the Central Advisory Council for Education (England) were asked by the then Minister for Education to consider the whole subject of primary education and the transition to secondary education. The Plowden Report

was published in 1967 and has since become the 'bible' of policy makers and practitioners in the field. In the context of the present discussion the Report was a landmark because it translated the theories of the day into official policy proposals. Recognition of the importance of a child's home environment for his performance in school was one of the Report's major themes, and the aspects of the environment which research had indicated - and the Committee accepted - as most influential were parental attitudes, and to a lesser extent, language behaviour.

Parental attitudes and language behaviour were believed to influence a child's performance in school by first influencing the child's own attitudes and language behaviour. On this model, children from adverse home backgrounds were seen as having neither the dispostion (attitudes) nor ability (language behaviour and hence thought-processes) to respond to what the school had to offer. Some of the policy proposals put forward in the Plowden Report stemmed directly from the theoretical model which had been adopted. Positive steps were to be taken to raise the standard of performance of children from the most disadvantaged homes; amongst the targets for intervention were to be the attitudes of parents, and the language behaviour and attitudes of the children.

As an attempt to raise the school performance of socially disadvantaged children, the 'Educational Priority Area' (EPA) programmes were not a success. In the opinion of the present writer, there are a number of probable reasons for this, some of which should have been apparent at the

time, and others which have only emerged with the benefits of hindsight.

It was through a consideration of the failings of the EPA programme and of the limited analysis of causal factors which had preceded it, that the design of the present study began to take shape. The criticisms are therefore described in some detail below. To put this discussion in perspective and to bring out the relevance of the points made to the task in hand, it may be noted in advance that in the present study attention was directed at variation in achievement level and parental behaviour within a working class population and that the main research task was seen to be the 'separating out' of a number of different home environment factors known to be related to achievement. The aims of the study are described in detail on pages 31-33.

Criticisms of the 'Educational Priority Area' Programme

(i) Area-based analysis: As the name of the scheme suggests positive discrimination in the programme was carried out on an area basis. Under such a policy, all children living in a defined area receive the additional benefits, whether they need them or not, but no child, however needy, living outside the area, receives any help. As was pointed out by Barnes, in a discussion of the London EPA programme, most poor families do not live in poor areas; they are scattered throughout the population: "the majority of disadvantaged children are not in disadvantaged areas and the majority of children in disadvantaged areas are not disadvantaged." (Barnes 75.) In similar vein, a report

on the reading standards of children in educational priority areas revealed that, whereas the majority of children did obtain test scores below the national average, there were still a substantial minority who were succeeeding in the task of learning to read. (Halsey et al 73.) In such circumstances, an intervention policy based on schools and neighbourhoods rather than indivudal children must necessarily be wasteful of resources and at the same time, a failure as far as meeting the full extent of the need is concerned. If more attention had been paid in the planning stage of the programme to the question of variation within socially defined groups, it is possible that the 'methodological fallacy' of area-based policies might have been avoided.

(ii) Educational remedies for social problems: Analysis of the Plowden Survey data had demonstrated that home factors were more important than school factors in accounting for variations in performance. Nonetheless, both the Plowden Committee and headteachers in the newly-designated 'Educational Priority Areas' considered that strictly educational measures could, in some circumstances, be used to remedy what were recognised as social problems. In the Plowden Report's often-quoted words, "What these deprived areas need most are perfectly normal, good primary schools.." The 'positive discrimination' which the Report then went on to recommend was seen by the Committee as an extension of this basic idea: "The first step must be to raise the schools with low standards to the

national average; the second, quite deliberately to make them better." It was argued in justification of this latter step, that in the homes of disadvantaged children, there was "..... little support and stimulus for learning. The schools must supply a compensating environment."

Unfortunately, the case for positive discrimination of any kind needed to be so vigorously argued on the ethical front that attention seems to have been distracted from a proper consideration of what the various sorts of programme could hope to achieve. School-based programmes were cheap and acceptable to the teaching profession. Logically, however, or on the basis of evidence available, there were no grounds for supposing that children who had previously failed to respond to education would start to do so if only their educational experiences could be adjusted in minor - very minor - ways. After granting that home backgrounds did influence children's disposition to learn, the assumption seems to have been made that, if only the right technique could be found, the battle for pupils' attitudes would be won, and learning would proceed. The EPA school-based programmes provided the evidence needed to show that this assumption is untenable: to quote from the third EPA report, when 'curriculum innovations' were tried, "Almost without exception, the measured effects on the school performance of the subject children were disappointing." (Barnes 75.)

(iii) Changing parental attitudes - limited analysis of problem and lack of proposals for action:

Parental attitudes and language behaviour were thought to be the principal mechanisms by which home background and social class influenced a child's performance in school. Since neither of these promised to be readily amenable to change, the preference for school-based action, if only as second best, is perhaps understandable. Some attempts were made to change parental attitudes, however, and while with hindsight they appear to have been misguided and based on muddled thinking, nonetheless it should be recognised that they were revolutionary in their time. In the past, policy and practice in the field of remedial education (an indicative phrase in itself) had been entirely school-based, focussing on teaching methods, group size, remedial reading techniques, and so on.

The aim of the EPA projects directed at parents was to raise children's level of achievement by improving the attitudes of their parents towards education. The main problem in implementing this idea was that the Plowden Report's proposals on the subject were unfortunately very vague: there was talk of encouraging parents to take more interest in education and of improving home-school collaboration. There was talk too of community schools and even of parents' rights. For many teachers, these ideas were translated into the objective of obtaining 'informed support' from parents - but how even that limited goal was to be achieved had never been made very clear. In the event, various attempts were made

to 'bring parents into the life of the school.' Almost without exception, they fell foul of the professional sensibilities of teachers and became demonstrations, not of parental involvement, but rather of the hostility which seems to lie beneath the surface of much 'home-school collaboration' in the U.K. educational system. (Young & McGeeney 68, Morrison 74, Cane & Smithers 71.) This point is discussed in more detail in Chapter 6.

In terms of raising children's attainments, these projects were never given a proper chance. It remains to be asked, however, if they were pointing in the right direction anyway. Prior to the Plowden Report, there was evidence available that many working class parents did not lack interest in their children's education. (Jackson & Marsden 62, Young & McGeeney 68.) The Plowden Survey itself produced much evidence, duly noted in the Report, to support this idea. It was only when 'interest in education' was assessed by the indices of parents' desire for education beyond the legal minimum, or their contact with schools, that a widespread lack of interest was apparent. Indices such as parents' expressed concern that their children acquire basic skills, or be given homework to do in the evenings, revealed a very different picture. (The age of the children involved was also a crucial factor here, with assumptions being made that indices of interest applicable to a 15-year old were equally so for a 7-year old. This question is also taken up in more

detail in Chapter 6.)

When the EPA programmes sought to increase the interest of parents of primary school children, they found that to a very large extent, they were interested already - in fact, too interested for comfort as far as many teachers were concerned. (See in particular Morrison 74.) The implications of this finding for the 'parental attitudes influence children's performance' theory have never been fully explored. Full accounts of the parental involvement aspect of the EPA programmes referred to above are given in Halsey 72, Midwinter 72 and Morrison 74: other schemes on similar lines are described in Green 68, Young & McGeeney 68 and McGeeney 69.

(It should be noted that the above criticisms of parent involvement programmes refer particularly to the interventions aimed at school-age children. Some of them are much less applicable to the pre-school programmes, especially the 'Red House' scheme run in the West Riding EPA (Smith 75.))

(iv) Uncertain educational relevance of parents' language behaviour

The educationally inadequate language behaviour of children from disadvantaged homes was supposed to result from the educationally unfavourable language behaviour of their parents. The idea of a direct causal connection between the two factors has not gone unquestioned however. Wootton (1974) found that evasive action on the part of parents answering their children's questions led to the development by the

children not of equally restricted language behaviour, but rather of increasingly elaborate questioning strategies. Rosen and other critics of Bernstein's theory argue that working class language has its own strengths and richness of 'meaning potential'. (Labov 70, Rosen 72.) The theoretical debate is a conceptually complex one and the problems of gathering empirical evidence in support of either side of the argument are great. All that can be said with any certainty is that the empirical work which has been carried out has not done justice to the sophistication of the underlying theoretical arguments and that the theory of parental language behaviour being a limiting factor in children's school progress remains 'not proven'.

(v) Uncertain educational relevance of children's language behaviour

Many of the EPA school-based programmes were non-specific 'curriculum innovations'; some, however, were designed particularly to improve children's language behaviour. (The biggest EPA language programme was aimed at pre-school children, but the same criticisms apply in either case.) A detailed criticism of such programmes would not be of direct relevance in the present context, but the central point needs to be made that there was quite inadequate evidence available to support the programmes' underlying theory, i.e. that children's language behaviour is a limiting factor in their early school performance. Since the EPA scheme was mounted, evidence has become available that children's spoken language development is unlikely to be setting the limit to

their ability to progress through a basic reading scheme, for example. (Francis 74b.) This idea has received support from a number of authorities in the field of child language development. (Tough 75, Halliday 73.)

Language projects which are conceptually more sophisticated than the early EPA programmes (as well as many which are not) are still being mounted for pre-school and school-age children (see for example Blank & Solomon 69, Tough 73b) but they have yet to prove their worth as far as subsequent achievement level gains are concerned.

(vi) Uncertain role of children's attitudes to education

The fourth cell of the 'parental attitudes and language behaviour influence children's attitudes and language behaviour' model is the effect which children's attitudes have on their school performance. (See, for example, Banks 68 and Cashdan 69.) That children who are not interested in school will do badly at school work seems altogether plausible. In the present context, it must be asked, however, if the disadvantaged primary school children who were the subjects of the EPA programmes were in fact not interested in school. Their low achievement seems to have been taken as proof - by a circular argument - that this must have been so, but there was, and - it seems - still is, no real evidence that this was the case. Again, a tendency to generalise discussion across age groups seems to have been an important factor here. Using only everyday experience as a guide, the lack of interest of many 15-year olds, or

even 9 and 10 year-olds, in education is undeniable - but 7 year-olds? Even at that young age, some children do appear to have 'turned away' from school but most, as a matter of common observation, seem extremely eager to please their own teacher, if not exactly enthusiastic about school in general. Admittedly, too much reliance should not be placed on common observation, but it must also be admitted that the apparent contradiction here has received insufficient attention from both theorists and empirical researchers in the past.

(vii) General inadequacy of empirical research in the field

A more general admission might also be made at this point, which is that research workers have provided policy makers with a very poor service in this field. If a model is being proposed to explain poor school performance - a model such as 'Parental attitudes influence children's attitudes which in turn influence performance,' for example - then it should be the responsibility of the model makers to produce evidence to substantiate their claim. Doing this properly would entail taking measurements of all reasonably accessible variables, particularly intervening variables, for it is on those that a model's explanatory claims rest. If action is taken to improve school performance - the end point of the model chain - then at the very least, measurements should be taken of changes in the target variable and, preferably, intervening variables as well. Unfortunately, there is little evidence of such rigour in the

research findings on which the Plowden Report and the EPA scheme were based, nor in the reports of the EPA interventions themselves.

The 'explorations' carried out into Bernstein's theories come in for particular criticism here. It is a truism in statistics that correlation does not imply causality. This caveat is completely ignored in the empirical studies by Bernstein's research team however. Characteristically, they seek evidence of an association between, for example, maternal language behaviour and children's IQ (Bernstein & Young 67, Brandis & Henderson 70) and on finding one, treat it as evidence for the existence of a causal connection between the two variables. In neither of the papers quoted here was the possibility raised that high IQ mothers might have high IQ children and educationally favourable language behaviour, or that these same mothers might have other educationally relevant behaviours as well. In no sense does empirical work of this kind put theoretical proposals to scientific test. Rather, the research findings are used to demonstrate previously accepted points and to provide 'illustrative examples.'

The analysis of survey data carried out for the Plowden Report (Peaker 67) was much more sophisticated than the work described above. Correlational data was again produced, and again used as the basis for drawing admittedly tentative conclusions about causality, but there was also another problem. Although a large number of different indices of home environment

were available - including 'Paternal interest and support,' 'Relations between parents and teachers,' 'Educational aspirations for child' and 'Parental interest in, and knowledge of, work child is doing at school' - Peaker argued that it was necessary to amalgamate many of these variables in the interests of statistical reliability. The main analyses were, therefore, carried out using composite variables and, while the purpose was admirably served of demonstrating the magnitude of the home environment effect, it was impossible from the results to discover which aspects of that environment were important and which were not.

The Present Study: Aims

The design of the present study grew out of the above considerations. Parental attitudes and language behaviour were once widely accepted as the intervening variables in the link between social class and children's school performance, but neither was of proven validity. The possibility existed that other intervening variables might be identified and shown to be more important. That variation existed in children's school performance and home circumstances within social class groups was recognised, but paid little attention. In particular, little was known about successful children from working class homes. Inadequate information was available on the inter-relationships of those aspects of the home environment which had previously been studied, and it was not apparent if all were really important for success in school, or if some were irrelevant.

In the present study, it was decided to investigate in detail the relationship - if any - between variation in attainment within a working class area and variation in the home circumstances of the children. A number of aspects of the home environment were to be studied, not just parental attitudes and language behaviour, and emphasis was to be placed on the 'separating out' of influences on attainment. These ideas may be re-phrased in question form as follows:-

(a) Can aspects of a child's home environment be identified which vary within a working class population? (For example: Can some working class families be characterised as more 'middle class' than others in their

behaviour and attitudes?)

(b) Do any of these environmental indices show a statistical relationship with children's school performance?

(c) What are the inter-relationships amongst the variables studied? Do 'predictors' of school achievement tend to go together, and if so, do all have their own unique contribution to make to prediction, or do some only 'borrow' predictive power by co-occurring with other more influential variables? For example: do parental attitudes exert their effect via measurable parental behaviours?

At this point in the planning of the present study, it was necessary to establish, in more detail, what was already known about the connection between social class and school performance, in addition to the work on parental attitudes and language behaviour already described. A literature review was therefore undertaken, with the explicit aim of finding out what variables had been studied, or even just suggested, in the past as potential links in the causal chain between social class and school performance. It was planned in this way to build up a list of potential 'predictors' of achievement, which could then be studied as described in (a) to (c) above.

It soon became apparent that most research had looked at only a small section of the 'causal chain' between social class and performance, with assumptions about the links in the chain not under investigation being all too commonly made. It was planned to put 'intervening variables' derived from research of this kind squarely to the test in the present study, by relating them both 'forward' to school achievement

and 'backward' to social class membership.

For the purposes of exposition, the literature consulted may be classified under the following three broad headings:

A. Accounts of the American 'Compensatory Education' movement.

The literature in this field was studied with the specific aim of finding out which characteristics of the 'disadvantaged' child's environment had been considered as particularly important for his performance in school. The search proved to be an unfruitful one, however, for a number of reasons.

Most of the early discussions of 'deprivation' and 'disadvantage' used as their starting point the knowledge that children living in certain types of 'inner city' areas tended to do badly in school. (Reissman 62, Deutsch 63, Passow & Elliott 68.) The association between environmental factors and school performance at the level of the individual child and his family was not of interest to these authors, their intention rather being to emphasise the extent of the problem by describing in vivid, but often, crude terms the material and cultural deficiencies of homes in deprived areas. In accounts such as these, the educational consequences of the social 'disadvantages' described were apparently thought to be self-evident and not in need of further delineation.

For present purposes, the chief drawback of this sort of writing was that the authors' lack of interest in mechanisms and processes at the individual level led them to describe the characteristics of disadvantaged children in

terms so general or so vague as to be uninformative. There is, for example, discussion of "alienation," (Kornberg 63), "apathy and detachment from formal educational goals and processes" (Passow & Elliott 68), a "lack of educational traditions in the home" together with "antagonism towards the culture of the school" (Reissman 62) - none of which lends itself very easily to formulation in terms of actual parent or child behaviour.

The above criticisms do not apply to all work in the field. The better projects and discussions were still not very helpful in the present context, however, not because they omitted to question which were the most influential aspects of a child's home environment, but because they arrived at very similar conclusions, by very similar means, to those reached by the Plowden Committee (Coleman et al 66.)

Parental attitudes and children's language behaviour were picked out as important variables and became the target of American intervention programmes, as they were later to be of British ones. (Race differences to some extent took the place of social class differences as the focus of concern in the American programmes, but the similarities of approach were very marked.) The criticisms which were levelled earlier in this chapter against language programmes and attempts to raise parental attitudes apply to the American projects as much as they did to the British ones. One exception to this is that evaluation of programmes has become almost a discipline in itself in the United States - a criticism which can hardly be applied to the British experience.

Halsey discussed the subject of compensatory education in some detail in his introduction to the first EPA report (Halsey 72), and spelled out some of the lessons which the EPA planners could learn from the American experience. Of particular interest in the present context, Halsey noted the success of parental involvement programmes run, in a number of American cities, by Gray & Klaus, Auerbach, Gordon, Weikart & Lambie and Schaefer. Most of these schemes involved sending home-visitors into the families of pre-school children with the aim of fostering mother-child understanding, communication, and activities likely to improve the child's cognitive development. The success of parental involvement schemes is of relevance to the present discussion because it endorses the general theme that home background problems can be tackled using home-based programmes as well as school-based ones.

However, the children in the above projects were only of pre-school age and, more importantly, the focus of the research was on bringing about change, rather than analysing existing sources of variation. For these reasons, the literature on the subject has little to say about the detailed components of a child's home environment, which are of relevance for success in school.

The American literature on 'compensatory education' is enormous and apparently expanding daily. Since it has also been reviewed extensively, it will not be considered in any further detail here. (For example, see Bloom et al 65, Bereiter & Engelman 66, McDill et al 69, Hunt 69, Little & Smith 71, Blackstone 73.)

This section has been devoted to a discussion of American

research. One piece of British work will also be mentioned here because its approach is very similar to that of the area-based American projects.

In 1971, Chazan et al reported the findings of the first stage of a Schools Council 'compensatory education' project. The research model used had been the selection of an area designated as 'deprived', followed by an investigation of the life experiences of children living there, with no further reference being made to school achievement after the initial assertion that deprived children tend to do badly in school. Mothers of children just about to enter infants' school were interviewed with the aim of finding out about the experiences they were providing for their children - "experiences which might be considered as helpful to the children in their subsequent adjustment to school." Children living in 'deprived' areas were compared with controls on a number of home environment indices, including demographic factors such as parents' education and occupation, indices of the children's play habits and experiences, the family's interest in books and reading, and the children's knowledge of school prior to entry.

The 'deprived' and control groups were found to overlap considerably, especially on the non-demographic variables. There was some suggestion that control area children were at an advantage in their exposure to books and other reading material, but on nearly all other variables, children with favourable and unfavourable experiences were found in very similar numbers in both the 'deprived' and 'control' groups. The authors concluded that, ". . . it

is necessary to be cautious in generalising, on the basis of the area in which they live, about the disadvantages children suffer: identifying educational priority areas is only a first step in identifying disadvantaged children."

This study may be criticised on a great many grounds, including the means employed for selecting sample children, and the statistical procedures used for analysing the data obtained. Many of the variables studied failed to discriminate amongst sample children, and, as the authors themselves conceded, deprived areas of Swansea were found to merge so gradually into non-deprived areas as to be virtually indistinguishable. Nonetheless, the report of the study gave a clear account of the information sought from mothers, and the questionnaire items used to elicit it. As a source of ideas about which background experiences might be relevant for adjustment to school, the Chazan project influenced the planning of the present study.

In Chapter 2, more reference is made to this project, and other studies from the compensatory education literature, when a detailed account is given of the selection of items for the present study's pilot questionnaire.

B. Descriptions of social class differences in parental behaviour and attitudes

Earlier in this chapter, work was described which sought to account for variation in children's school performance by variation in the attitudes and values of their parents. The work described in the present section, however, did not stem from an interest in school attainment (although the implications of findings in this direction were sometimes

recognised): rather, it stemmed from a sociological - almost anthropological - concern to document the behaviour and belief systems of identifiable sub-groups of people within the general stream of western culture.

Klein (1965) in Vol. 2 of a book entitled 'Samples from English Cultures,' gave a descriptive account of child-rearing practices in English middle class homes and 'rough' and 'respectable' working class homes. She went on to conjecture about the likely implications of the differences observed for the school careers of the children, but did not present any evidence to add substance to her ideas on those points. Characteristics of the home environment discussed by Klein in this context included the parents' disciplinary methods, the extent of parental supervision over children's play, and the role of fathers in children's upbringing. A lot of space was also devoted in this book to descriptions of maternal possessiveness, indulgence versus strictness in the formation of personality characteristics and so on, but these aspects of child-rearing were considered to be of limited relevance in the present context.

Detailed descriptions of social class differences in child-rearing methods were also found in the Newsons' book 'Four Years Old in an Urban Community' (Newson & Newson 68) (The volume on seven-year olds was not published until 1977, some time after the present study had been completed.) Some child-rearing methods which were likely to have direct consequences for children's experience of school were described, such as independence training, and 'patterns of persuasion and compulsion,' but there were also lengthy accounts of toilet training and bedtime rituals which

were not considered to be of importance for present purposes.

Bronfenbrenner in 1958, reviewing the subject of 'Socialisation and Social Class through time and space' concentrated on discipline and independence training, and general texts on child-rearing practices were found to do the same (Sears, Maccoby & Levin 57.)

Two isolated studies with a different emphasis deserve mention: Macdonald et al (1949) looked at the leisure activities of children from different social classes, and found that there was a significant increase in the number of family-based activities as the social class scale was ascended: and Keller (1963) in similar vein, recounted how 'slum' children enjoyed very little shared family activity, and indeed, had little sustained contact of any kind with adults.

A number of general sociological accounts of the lifestyles of particular social groups were also studied. (Wilmott & Young 1960, Young & Wilmott 1957, Wilmott 1963.) Although these authors did not have a specific interest in child-rearing practices, social class differences in this area were referred to as part of the overall picture presented. Particularly striking were the reported differences in the participation by fathers in their children's upbringing: in working class families, the onus of child-rearing appeared to rest almost entirely on the mother, whereas middle-class families seemed to be more 'democratic' in this respect. Both the Klein and Newson accounts had presented evidence leading to this same conclusion: paternal participation in the upbringing of children undoubtedly declines with social class. Quite

another question is whether or not this, or any other aspect of child-rearing described above, is of any significance for the school attainment of children. Within the framework described on page 32, this was one of the questions to which the present study addressed itself.

At this point, reference is again made to Chapter 2, when an account is given of the sifting and selection of variables for inclusion in the present study.

C. Research linking parental behaviour and children's achievements

In 1937, Burt wrote that, in his opinion, the feature of the home environment which was most closely related to school progress was "not the economic or industrial status of the family, but the efficiency of the mother." Exactly what he meant by 'efficiency' was unfortunately not made clear enough to be helpful in the present context.

A concern with the question of social class as a source of variation in parental behaviour lay behind the statement by Burt quoted above, but not all the work referred to in this section was carried out with reference to, or any obvious relevance to, social class differences.

Work on this subject in the 1950's and early 1960's, for example, looked at such factors as over-protectedness (Sutton 61), emotional supportiveness (Morrow & Wilson 61), parental expression of affection (Milner 51), parental pride and confidence in their children (Kurtz & Swenson 51), over-anxiousness and demandingness (Kent & Davis 57), nurturance (Crandall et al 64) democracy (Baldwin 55) and child autonomy (Bing 63) as potential predictors of children's abilities and attainments, but none of these seemed very suitable for

the purposes of the present study.

Reflecting the concern of the later 1960's with parental attitudes and language behaviour, Swan & Stavros (1973) reported that their investigations had led them to the conclusion that good parents had a "helpful and encouraging attitude towards their children as curious adventurers, creative and independent learners." Such parents often interacted with their children in "non-conflict situations," and provided them with a rich verbal environment.

A paper by Barton et al, 'Child rearing practices and achievement in school,' published in 1974, is a late example of the preoccupation of researchers with disciplinary methods and parental 'wərmth' as the most important mechanisms by which parents influence the behaviour - in this case the school achievement - of their children.

Rather more helpful was a paper by C.P. Deutsch (1967), which described a 'deprivation index.' When applied to 'households of ostensibly the same socio-economic status,' this index was said to reveal differences in the 'social experiences' provided by different families, such as trips away, the amount and type of parent-child interaction, the organisation of the home, and so on. These differences were also reported to be associated with scores on verbal and IQ measures given to the children.

In 1963, a paper appeared entitled 'The identification and measurement of environmental process variables that are related to educational achievement.' (Dave 63.) The 'process' variables constructed were found to have a higher correlation with children's achievement than did the 'frame'

variable of social class, and this was taken as evidence that "parents with relatively low levels of educational or occupational status can provide stimulating home environments for educational achievement. It is what parents do in the home rather than their status characteristics which are most influential on the achievement of their children." All of which sounded very promising: unfortunately, the paper provided inadequate information as to how the 'environmental process variables' had been constructed from interview data. In particular, information was lacking on the procedure adopted for selecting questionnaire items, and also the rationale behind their combination into scales and subscales. A number of other studies using the same, or very similar 'environmental process variables' have since appeared (Wolf 64, Weiss 69, Marjoribanks 1971, 1972a and b, 73 and 74, Walberg & Marjoribanks 1973) but the basic problem of inadequate information has not been remedied and the usefulness of the work is severely limited in consequence.

In any discussion of parental behaviour and children's achievement, the study of Hess & Shipman (1965) must be mentioned. These workers found that, in a laboratory task, middle class mothers were more effective teachers of their children than were working class mothers. The same workers found that, relative to working class mothers, more middle class mothers said that they would give their children specific instruction and preparation for starting school. (Hess and Shipman 67.)

Cullen in 69, Miller in 71 and Husen in 72 reviewed the relevant literature with the specific purpose of finding out

more about the processes underlying social class differences in school performance. (See also Freeberg & Payne 67, Bloom et al 65, and Wilson 71.) Familiar themes kept emerging in different guises, but no original ideas were apparent. Miller's own study reflected this dearth of 'fresh air'. He found that in the homes of high achievers, there was more independent thinking and freedom of discussion, values conducive to intellectual effort and enterprise, support and encouragement of children's curiosity and school aspirations, a lack of over-indulgence and harmony between the values of home and school. (Miller 71) Cullen's own study produced very similar findings (Cullen 69.)

Sharrock in 68, and Husen in 72 made explicit pleas for more research to be carried out into 'environmental process variables' (i.e., intervening variables in the social class/school performance relationship) in order that research might guide action more successfully than it had done in the past. Gagne (1970) used a different terminology - 'distal' and 'proximal' instead of 'frame' and 'process' variables - but put forward the same arguments.

The literature reviewed in this section suggests that the task has scarcely begun - only a small number of 'process' variables have received serious study, and many of them are unsuitable as guides to action, either because the causal factors they indicate appear to be unmodifiable, or because the variables studied do not lend themselves easily to interpretation in direct-action terms - the work of Wolf & Dave would fall into this latter category, for example. This subject is discussed in greater depth in

Chapter 2.

The selection of the target population and the criterion variable for the present study

At this point in the literature review, an important decision had to be made concerning the age-group of child to be studied in the present project. Most of the Government Reports which drew attention to the problem of social class in education were concerned with children of secondary school age. Social class differences in school achievement are, however, apparent years before that, as the Douglas, Plowden and National Child Development Study surveys established. (Children from different social backgrounds also differ in many ways before they ever come to school. Some of these differences seem likely to be relevant for subsequent school progress, but this has yet to be established for certain.)

The youngest age at which reliable performance measures seemed to be available was 6-8, the age of transfer between infant and junior school. This age group had the further advantage of having been extensively surveyed in the past, and good comparative information on standards of performance was available. (Davie et al 72, Butler 71, Berger & Yule 71, Halsey et al 73, Inner London Education Authority 69 & 72.) More importantly, the younger the child, the less likely it seemed to be that home environmental influences on achievement level would have been contaminated by peer group influences, teacher expectations and the child's own reaction to his past school performance. The decision was, therefore, taken to study children at the age of transfer from infant to junior school.

Early school achievement is a strong predictor of subsequent performance (Douglas et al 68, Peaker 71.) Understanding the influences on the achievement level of a 7 year-old is quite obviously not the whole story as far as the effect of social class on education is concerned - very different forces are likely to be operating on a 12 year-old, for example - but it is an important beginning.

Once the age group to be studied in the project had been decided, it was found that the choice of attainment measure had become virtually a foregone conclusion. Reading ability, it soon became apparent, was the best indicator available of how well a 7 year-old was getting on in school. When describing standards of performance in the EPA's, Barnes wrote, ". . . it seems to us that reading performance is a powerful indicator of the degree to which a child is being assimilated into the main academic culture of the school." (Barnes 75.) Early reading failure is known to be a good predictor of poor school achievement in later years. (Cockburn 73, Morris 66, Clark 70, Ross & Simpson 71a, Bloom 76.) Social class differences in reading performance are also well-documented. (Morris 66, ILEA 69 & 72, Rutter et al 70, Davie et al 72, Nisbet et al 74, Douglas 64.)

Finally from a practical point of view, reading performance is a good choice as the outcome variable in a research project, because objective tests of reading attainment are readily available, together with age standardisations of test scores, and in some cases, normative data from national samples as well.

Home Environment as a Factor in Reading Achievement

Choosing reading as the criterion variable in the present project had, it was soon discovered, one disadvantage: it opened up whole new libraries of relevant literature. It did,however, soon become apparent that studies of home environment and reading achievement made up a very small proportion of the total body of research into factors influencing reading performance, and that this in turn was only a fraction of the overall documentation of reading standards, techniques for teaching reading, means of assessing reading progress, hierarchies of reading skills, models of the reading process, and so on. (To give a recent illustration, in the 1977 'Summary of investigations relating to reading' published in the journal, 'Reading Research Quarterly' (Weintraub et al 77) 599 studies were listed for the period July 75 to June 76. Only 10 studies, however, fell under the heading of 'Socio-cultural factors and reading.')

As far as can be judged from a study of the literature on reading, children's home environment has been paid relatively little attention by reading practitioners and research workers alike. The preoccupation, it might almost be said the obsession, of nearly all involved parties seems rather to have been with the fine details of the teaching of reading, in particular with the relative merits of different teaching methods and techniques.

Widely, and quite uncritically accepted as influences on a child's ability to make progress in reading are - not unexpectedly - his language background, the cultural characteristics of his home and his parents' attitude to

education. (Department of Education & Science 70, Reid 72, Vernon 71, Kavanagh & Mattingley 72, Goodacre 68b.) Other factors from outside the school environment are sometimes implicated indirectly in discussions of reading progress, because they influence children's emotional, motivational or physical state (Schonell & Goodacre 74, Gredler 71) or because children from certain sorts of homes seem to be more equipped than others to deal with the terminology of school learning. (Downing 69 & 72, Reid 66.) Parents and homes, it emerges, are most often mentioned with reference to reading when a child's performance is poor and a cause for complaint. (Some authors do not acknowledge the significance of home background even in these circumstances - see, for example, D.E.S. 72 and Pumfrey 72.)

Morris 66 and Vernon 71 reviewed the research literature on social class factors in reading achievement. Predictably enough, the most often studied variables had been the cultural characteristics of the home, the degree of parental encouragement and parental language behaviour; but even in these categories, the number of empirical studies to be cited was not large. In Morris' own study (1966), 'good' and 'poor' readers were compared on a variety of home background factors including 'parental help with reading' as well as the usual 'number of books in the home' and 'library membership' variables. This study, while unsatisfactory from a methodological point of view, influenced the planning of the present project by suggesting 'parental help with reading' as a home background factor worthy of investigation: further details are given in Chapter 2. None of the other reading studies

was of direct help as far as the selection of environmental variables for the present project was concerned.

It may be noted at this point that studying the reading literature led to the formation of one very strong impression: reading teachers and reading researchers do not appear to regard the effect of social class with any spirit of curiosity. It can only be supposed that this is because their ideas of relevant influences - the language background and cultural characteristics of the home, for example - are already well-formed and thought to be beyond the need of confirmation.

Other factors in reading progress

Although not directly relevant to the planning of the present project, reference was also made to the wider literature on 'factors in reading progress.' Unwittingly, the present study had become yet another piece of reading research; it was therefore necessary to acquire some awareness of the factors, other than home environment factors, known to be associated with reading performance.

In Schonell & Goodacre 74, 'Factors in Reading Ability' were described, with research evidence, under five headings: general maturity, level of general intelligence, abilities of visual and auditory discrimination and recognition of word patterns, environmental factors, emotional attitudes of interest and individual application and confidence. ('Environmental' factors were said to influence reading progress in two ways: "in terms of the language background and associated experiences of a verbal and general kind which serve as a foundation and continuing

support for learning to read - such conditions including not only experiences of a concrete kind, but attitudes towards reading and school learning as well," and, "in terms of the quality of the home life and its influence on the child's security and hence on his ability to apply himself to his school tasks.")

Cane's review of the research literature in Morris 66 divided variables up into 'Children's individual attributes' (which would include Schonell & Goodacre's items 1, 2, 3 and 5) and 'Environmental' factors. Included in the latter were both home and school environmental factors, with 'school factors' covering everything from overall school organisation - size, streaming policy and so on - to teaching methods and approaches, and on to characteristics of the teacher herself, such as her age and years of experience.

Another review, concentrating on studies of children's 'individual attributes' is that of Gredler 71.

It may be noted in passing that, from the research point of view, little attention has been paid to the problem of 'separating out' the various factors influencing reading progress, or of attempting to quantify the relative magnitudes of the various effects. Most studies have done one of two things: either they have sought to demonstrate the importance for reading performance of a specific variable, say, audio-visual integration, by finding a correlation between scores on the two variables (or showing that poor readers had lower audio-visual integration scores than good readers); or they have adopted a try-anything approach, looking for any variable, individual or environmental, which correlated with reading performance (or discriminated

between good and poor readers.) The Morris 66 study falls into this latter category, and so also do the following: Malmquist 58, de Hirsch et al 67, Cane & Smithers 71.

If a variable, individual or environmental, can be shown to be associated with reading performance, then that appears to be the end of the line as far as research on that variable is concerned. Home environment variables are listed and recognised by reading experts as influences on performance, but the idea that the magnitude of their importance should be evaluated by comparison with other types of variable seems to be an alien one in this field. Emphasis on 'diagnosing' the cause of reading failure in individual children as opposed to studying its correlates in large samples of children is probably a contributory factor here.

In Table 1 below, a list is given of some of the variables which have been studied in connection with reading achievement: it is intended to be illustrative rather than comprehensive. The studies are grouped under the headings which emerged during the practical process of literature searching, rather than in accordance with any theoretical framework. It will be noticed that some of the topics listed clearly overlap to some extent with the idea of an influential home environment; these topics are marked with an *. Investigating the inter-relationship of home environment influences on reading progress with the effects of even a fraction of these variables would have been beyond the resources of the present study. One factor in reading performance, which is not mentioned in the Table, was however selected for detailed investigation in the present study; this was IQ. The relationship between IQ

and home environment influences on attainment is discussed in some detail in the following section.

TABLE 1

READING RESEARCH

Topics investigated include the following:

1. The effectiveness of various teaching methods and remedial techniques. (Cashdan & Pumfrey 69, Pumfrey 69 & 72, Fairman 72, Lawrence 73, Reid 72, Morris 66.)

2. School environment and organisation - including streaming policy, class size, school equipment and library provision. (Kemp 55, Coleman et al 66, Morris 66, C.A.C.E. 67, Cane & Smithers 71, Wiseman 67, Wilson 71, Peaker 71, Little et al 72, Douglas 64, Douglas et al 68, Barker-Lunn 70.)

3. Characteristics of the teacher - including years of experience, conception of her role, participation in in-service training. (Morris 66, Goodacre 68a, Cane & Smithers 71, C.A.C.E. 67.)

4. Psychological characteristics of the child. Often studied by comparing good and poor readers. Sometimes studied with the explicit aim of tailoring remedial techiques to the 'deficiencies' of the learner. General reviews in Gredler 71, Schonell & Goodacre 74, Morris 66, Pumfrey 72, Cashdan 69, Stones 70. Examples of specific factors investigated are listed below:

   Associative learning (Evans 72)
   Auditory blending (Chall et al 63)
   Auditory discrimination (Durrell & Murphy 53, Wepman 60, Dykstra 66.)
   Auditory-visual integration (Birch & Belmont 64, Muehl & Kremenak 66, Cashdan 70.)
   Auditory-visual shifting (Raab et al 60, Katz & Deutsch 63.)
   Laterality characteristics (Balow 63, Stevenson & Robinson 53, Douglas, Ross & Cooper 67, Belmont & Birch 65, Coleman & Deutsch 64, Clark 67 & 70.)
   Left-Right discrimination (Coleman & Deutsch 64, Belmont & Birch 65, Clark 70.)
   Letter sequence matching (de Hirsch et al 67.)
   Memory for digits (Hirst 70.)
   Perception of orientation (Weiner et al 65.)
   Perceptual-motor development (Lachmann 60, Smith & Keogh 62, Clark 70.)
   Verbal labelling (Blank & Bridger 66.)
   Visual sequential memory (Hirshoren 69.)

5. Neurological problems and 'dyslexia.' (Lovell & Woolsey 64, Kinsbourne & Warrington 63, Reid 68, Naidoo 72, Critchley 70.)

6. Demographic characteristics of the child - sex, age, month of birth, birth order effects . Also physical characteristics - vision, speech and hearing defects. (Morris 66, Davie et al 72, Rutter et al 70, Douglas 64, Pringle et al 66, Cane & Smithers 71.)

*7. Psychiatric disorders, maladjustment, and reading failure. (Sampson 66, Rutter et al 70, Davie et al 72, Morris 66, Douglas et al 68, Sturge 72, Wall 55, Wall et al 62.)

8. Personality characteristics of the child. (Zimmerman et al 65.)

*9. Teacher expectations and pupil performance. (Pidgeon 70, Goodacre 68a, Cane & Smithers 71.)

*10. Language concepts and the teaching of reading. (Downing 69 & 72, Reid 66 and 72 .)

11. Spelling, traditional and non-traditional orthography, the Initial Teaching Alphabet. (Downing & Gardner 62, Downing 64, Downing & Jones 66.)

*12. Reading readiness. (Weiner & Feldman 63, Chazan 70, Downing & Thackray 71, Hardy 73, Thackray & Thackray 74.)

13. Models of the reading process. (Reid 72 & 73, Schonell & Goodacre 74, Merritt 69, Fries 62, Gray 56, Daniels & Diack 56, Spache & Spache 73. See also Item 14 below.)

14. Psycholinguistics and reading. (A special example of 13 above.) (Kass 66, Goodman 70 a & b, Kirk & Kirk 71, Smith 71 & 73.)

*15. Sociolinguistics and reading. (D.E.S. 70, Wilkinson 71, Halsey 72, Francis 74a and b. See also earlier sections for review of work by Bernstein et al.)

*16. Children who read before school - individual and home environment characteristics. (Almy 49, Durkin 66, Torrey 73, Clark 75b)

Reading and IQ

The relation between these two variables has been studied in a bewildering variety of ways since the 1930's and 40's. (See, for example, Schonell 42, Malmquist 58, and reviews of relevant literature in Cane 66, Belmont & Birch 66, Moyle 68 and Moseley 75.)

In these early studies, attention was frequently focussed on discrepancies between ability, as measured by IQ, and attainment, as measured by reading performance. Children

were 'underachieving' if performance lagged behind 'potential' and underachievement required explanation. This idea of comparing actual and potential achievement is still very much alive today, although the terminology has changed. To quote from Rutter and Yule 75, "The distinction is between general reading backwardness and specific reading retardation. Backwardness describes reading which is backward in relation to the average attainment for that age, regardless of intelligence. Retardation, on the other hand, is a term used to describe a specific disability in reading - specific that is to say in the sense that the reading difficulties are not explicable in terms of the child's general intelligence."

The distinction between reading backwardness and retardation is discussed in some detail in this and other publications by Rutter and his colleagues (Rutter et al 70, Rutter and Yule 73, Yule 73, Yule et al 74.) The method used in the Rutter et al studies for assessing retardation is a relatively sophisticated one statistically speaking - they 'predict' reading test score from chronological age and IQ score, using regression equations (Yule 67.) There is, however, one major drawback to all work of this kind, and that is it distracts attention from an overall depression of functioning. It is now widely recognised that IQ scores may be depressed by adverse environmental influences (C.A.C.E. 63, Douglas 64, Halsey 61, Hunt 61, Vernon 60 & 68.) Indeed Rutter and colleagues admit this in their papers. They do not, however, go on to consider the full implications of this admission for the assessment procedures they recommend: children from

adverse environments whose poor reading performance is associated with a depressed IQ cannot, in Rutter & Yule's terms, be said to be underachieving; their low achievement is in some sense to be expected. The use of such an approach in practical contexts might easily lead to children being unfavourably labelled, with teacher expectations then being adjusted accordingly. The outcome of such a process would almost certainly be against the interests of the children concerned.

It is common practice in educational research to 'allow for' the effect of IQ when assessing the impact of some other variable on attainment. Thorndike (1963) even considered that any new research on attainment should be aimed from the start at identifying those factors which made a contribution to prediction over and beyond that made by IQ. In effect, this means using IQ to calculate an 'expected' attainment score, then seeing if environmental factors, for example, can explain discrepancies between this 'expected' level of performance and the level a child actually achieves. The same sort of criticism applies to this idea as to the Rutter and Yule proposal: environmental factors which depress both IQ and reading performance will be under-estimated in importance if the Thorndike system is employed, because the predictive power attributed to them will reflect only the extent to which their influence on reading is greater (or less) than their influence on IQ.

In recent years, a number of studies have been carried out using IQ measures as dependent, rather than independent variables. (Bernstein & Young 70, Brandis & Henderson 70,

Cook 73, Wolf 64, Cropley & Ahlers 75.) In no study, however, have the inter-relationships of IQ, home background measures and reading performance been explored in full.

It was, therefore, decided that IQ data would be obtained in the present study, and put to as many uses as possible. First of all, it would be used to counter possible criticism: a high IQ and a favourable environment do tend to occur together, and critics might argue that apparent home environment effects were really due to underlying differences in IQ. More interesting, however, would be the study of IQ as a dependent variable, and also the investigation of the inter-relationship between the IQ and home environment indices used as joint predictors of reading achievement.

It was planned, in addition, to study the pattern of IQ subtest scores in relation to home environment indices and reading performance. The paper by Belmont and Birch (1966) entitled 'The intellectual profile of retarded readers' was the source of ideas in this instance.

Before concluding this literature review, two publications must be mentioned, both of which appeared in 1975 after the planning of the present project had been completed.

The Bullock Committee had had as its brief the consideration, in relation to schools, of all aspects of the teaching of English, including reading, writing and speech. (The Committee had been appointed following the publication of an NFER report (Start & Wells 72) which suggested that reading standards were in decline.) The general position adopted by the Bullock Committee as far

as home environment influences were concerned was in principle the same as that adopted by Plowden: much significance was attached to parental attitudes and language behaviour, but only vague suggestions were made about fostering desirable practices. (D.E.S.75.)

Both the Bullock Report and a review publication by Moseley entitled 'Special Provision for Reading' included descriptions and discussions of the research literature on reading standards, social class differences, home background factors, intervention programmes, compensatory education, the role of intelligence - and so on. While elaborating on many of the themes discussed above, neither publication introduced any really new ones, and the state of understanding about social class differences in school performance was substantially the same at the end of 1975 as it had been at the beginning.

The Present Study: Design and Methodology

The research task

As described in detail earlier,(page 31),the aims of the present study were seen as twofold; to look, in a working class population, at the variation in children's home backgrounds and levels of achievement, at the stage of transition from infant to junior school; and to examine the inter-relationships and patterns of association amongst the variables studied.

From a research point-of-view, a wide variety of possible indices of home background were recognised, including the demographic characteristics of the home, such as family size and whether or not the mother was working, and also less tangible variables, such as the child-rearing practices of the mother, her language behaviour, her interest in education and so on. The main research problem was seen to lie in disentangling such a complex network of inter-related causes and correlates, in order to find out more about the aspects of a working class home which really influence children's school performance, and about those which do not.

A more precise formulation of questions to be asked was at this point deferred. The view was taken that a more adequate appreciation needed first to be gained of the type of sample and quality of data necessary in principle to answer certain types of complex question. These are design problems, and are included as such in the considerations below.

The study design

It was recognised from the beginning of the study that, although discussion can usefully proceed in terms of 'causes'

of achievement level, at best only correlates can be established by seeking associations between variables in an existing 'real life' situation. In such circumstances, it is impossible to establish whether a particular variable is associated with achievement level via some true causal mechanism, or whether the association is merely a 'symptom' of some other underlying cause or causes. 'Experimental' research designs, in which target and outcome variables are measured before and after some intervention has taken place, can provide more - but still incomplete - information about causal factors than can 'survey' designs. Experimental designs were, however, ruled out in the present study for both theoretical and practical reasons: theoretically, because the present study was designed to generate hypotheses, not to test existing ones, and practically, because manipulating the home environment of sufficiently large numbers of children would have been beyond the resources of the present study, even if a suitable target behaviour had been apparent.

Having ruled out experimental studies a further choice remained to be made between a study of contrasting groups on the criterion variable of school achievement, or a study of the correlates of that variable over its whole range. The latter method was adopted for the following reasons.

The method of contrasting groups is very poorly adapted to studying the inter-relationships amongst variables. With this design, a satisfactory index of the relationship between predictors is difficult to obtain; hence it is not possible to establish to what extent predictors overlap in their influence on the criterion, or to assess the 'unique' contribution of any one predictor by measuring its effect while controlling for the influence of others.

(N.B. This issue is taken up in more detail in later chapters.)

A contrasting groups design effectively limits the researcher to gathering information about a series of separate variables. These individual variables cannot be fitted into an overall pattern of inter-related factors, and only a very incomplete understanding of the determinants of criterion variation can be obtained.

Since one of the express aims of the present study was to investigate the inter-relationship of home environment factors in the determination of achievement, the drawback described above was itself sufficient to rule out a contrasting groups design. The design has other disadvantages, however, the main ones being:

(i) An analysis based on only part of a population (say, the top and bottom quarters of the achievement level distribution) is less sensitive than one based on the whole group.

(ii) Ambiguous or misleading results may be obtained if the predictor variable is not linearly related to the criterion - if the function is U-shaped, for example, with both high and low achievers scoring more highly on a certain factor (poor peer relationships, for example) than the average child, or if there are threshold relationships or 'diminishing returns.' A correlational analysis, combined with the plotting of appropriate scattergrams, provides much fuller information in these circumstances.

(iii) If two extreme groups are being contrasted (say, the best and worst readers) the findings are only interpretable if it is assumed that the same kinds of factors are associated - in opposite directions - with

high and low performance. This may not be the case. Extremely good and extremely poor performance at reading may be qualitatively as well as quantitatively different phenomena, i.e., the causes and correlates of the two may be quite different.

There are some empirical findings in the literature to substantiate this claim. (Wiseman 64 & 67, Wilson 71.)

Once again, a full correlational analysis together with appropriate scatter-plotting is a much better method of tackling this problem than is a study of contrasting groups.

(The comparison of poor achievers with a group of average or normal achievers would go some way towards meeting objections here. It would, however, be less efficient at bringing out differences between the two groups, and it is this efficiency which is the one real advantage of using comparison groups at all. To be more exact, the comparison groups method provides more information per case studied than does a correlational analysis; i.e., a study of the top and bottom ten per cent of a distribution is more likely to identify predictor variables than is a study of a random twenty per cent from the whole range of the distribution. The most sensitive method of all, however, is to study the whole sample and analyse the results using correlational methods.)

A full discussion of the design problems associated with the investigation of achievement variation is given in Thorndike 63.

The design finally chosen for the present project was to study the correlates of the full range of levels of achievement to be found in a working class population, looking specifically at the inter-relationships of any predictors found. The statistical method most suitable for this type of study is that of multiple regression analysis. Using this technique, a dependent variable or 'criterion', e.g. reading test score, is 'predicted' from one or more independent variables, e.g., indices of the home environment. The overlap of the different environment indices can be studied, and also their inter-relationship in the determination of reading performance.

The most widely used form of this technique is based on a 'general linear model,' which assumes that the form of the relationship between predictor and criterion is basically a linear one. Visual checking of scatterplots ensures that extreme violations of this assumption are detected and remedied, either by making statistical allowance for the form of the more complex relationships, or by transformation of the predictor scores to obtain a linear relationship with the criterion. These matters are taken up in more detail in later sections of this report.

The purpose of the present section is to explain in principle how multiple regression analysis was used to answer the kind of questions posed in the present study. (See pp. 31-33.) To this end, two main types of question may be distinguished.

1. Questions based on the relationship between reading score and a single predictor.

It was desired to know if variables which had been identified as predictors of achievement in a representative sample of the population would retain their predictive power in a uniformly working class sample. With only a restricted range of occupational groups being represented in the population under study, it might be expected that the social class effect would itself be attenuated, while the predictive power of other variables might also be affected.

Investigating these possibilities within a multiple regression framework was recognised as being very straightforward: all that was necessary was to carry out a series of analyses predicting reading score from one home environment variable at a time, and to take note of which variables showed a statistically significant relationship to the achievement measure and which did not.

Similarly, it was planned to look at the relationship to attainment of home environment indices other than established predictors, and to compare their predictive power with that of the previously recognised home environment variables. A series of univariate predictions was again the answer here. The advantage of this particular approach is that the relationship between each home environment index and reading score is expressed as a correlation coefficient of some kind: i.e., the strength of the relationship between each index and reading is expressed in a similar way, enabling comparisons to be made amongst the various predictors.

2. Questions based on the relationships between reading score and two or more predictors.

As has been pointed out, multiple regression techniques are particularly well-adapted to studying complex inter-relationships amongst networks of variables. In the present study, it was planned to use these techniques to find out :

(a) If 'process' or 'proximal' variables (see p. 43) such as mother's language behaviour or disciplinary methods went some way towards explaining the effect of 'frame' or 'distal' variables, such as social class. (For example, are mothers in 'skilled manual' families more likely to have beneficial styles of language behaviour than are mothers in 'semi or unskilled' families? If so, and if language behaviour is correlated with achievement, are the language behaviour differences at least partly responsible for the social class differences in achievement level?)

(b) The extent to which 'proximal' variables overlapped, and if they did so, whether all had a unique contribution to make to prediction, or whether some only appeared important by association with other influential variables. (If mothers with educationally favourable disciplinary methods tended also to have favourable language behaviour, for example, did controlling for the latter reduce the correlation of the former with achievement?)

Details of how these different types of analysis were carried out are given in the 'Analysis' sections of this report, together with discussions of how the statistical findings may be interpreted.

Before moving on to the next section, it may be noted that only the first part of Question 1 above, refers to the testing of existing hypotheses. The rest of Question 1, and all of Question 2, involve the formation as well as the testing of ideas about potential new predictors; the answering of such questions takes a minimum of two stages. In the first of these, a large number of potential predictors are tested; a sifting process is then carried out to find out which, if any, of these variables are related to achievement level, and the specific hypotheses generated by this 'pilot' are tested on completely new data.

Methodology

Having asked the questions, and decided upon the type of study design most fitted to answering them, decisions remained to be made about the kinds of data to be collected.

Considering first the criterion variable of reading performance, it was necessary to decide how this should be measured. An objective and quantitative measure was required, ruling out teacher ratings and suggesting instead the use of a standardised test. (Since it is known (Goodacre 68a)that teachers' estimates of their pupils' abilities are influenced in a complex way by their ideas about the children's home circumstances, it was considered that teacher ratings would be particularly inappropriate in a study of the present type.) A group

test was needed in order to asses large enough numbers of children in the time available, but choice was found to be very limited for children in the age range of the present study. It was planned to test children in the pilot project, for example, in their final term of infants' school, when their ages would be in the range 6:11 to 7:10.

The test finally chosen was the Southgate Group Reading Test 1A, with a recommended age range of 6:00 to 7:06. The detailed considerations which led to this choice are given in Appendix 2, together with a description of the test chosen. It was known in addition that the Southgate had previously been used in three large surveys of reading ability in 7-year olds, data from which was, therefore, available for comparison purposes. (Butler 71, Berger & Yule 71, Davie et al 72.)

Moving on to consider the question of collecting the home environment data, the obvious course to take was to interview mothers. Interview data was the basis of the Plowden Survey, the Newsons' studies of child-rearing practices, and many other investigations in the literature. Alternative means of data-gathering, such as observation methods in natural or contrived settings, have, in general, been little used in studies of home environment factors and achievement. (The Hess & Shipman 65 study is a rare example of the second-mentioned approach.)

The main scientific - as opposed to practical - reason for this is presumably that most studies in the past have not been in the position of testing well-developed hypotheses. To carry out an observational study, it is not

only necessary to have the relevant dimensions of behaviour well established beforehand, but also to have coding categories defined, and operational definitions of behaviour worked out for each category: either that, or the situation is contrived in order to channel behaviour in very specific ways, dictated by previous empirical findings or theory.

The present project, like the Plowden and Newson studies, was concerned to identify dimensions of difference in parental attitudes or child-rearing practices, rather than test very specific ideas about their form or patterns of occurrence. In these circumstances, observational methods were considered to be inappropriate as well as unfeasible, and the interview method was accepted as the most suitable - and practical - means of gathering the study data.

On the negative side, interview data has the obvious disadvantage that mothers may not behave as they say they do, either because of deliberate deception of the interviewer, or because mothers' perceptions of their own behaviour may be inaccurate. On the positive side, if mothers' reports do reflect their behaviour to a substantial extent, then interviews are a very economical means of learning, not only about mothers' behaviour towards their children, but also about attitudes and opinions - variables which can only be indirectly assessed by more 'objective' techniques.

From a practical point of view, the task was seen as one of minimising the drawbacks of the interview method, by ensuring that interviewees were placed under no pressure to give socially acceptable responses. (See Newson and Newson [68] for a discussion of strategies here.) This

involved giving careful thought to the order and wording of questions to be asked, as well as the style in which the interviews were to be conducted. In particular, it was decided that any suggestion of an association with 'authority' was to be avoided, and that the atmosphere of a 'survey' in market research style was to be deliberately fostered instead.

The next step was to decide the exact content of the interview schedule for the first 'pilot' study, a procedure which is described in the following chapter.

(The relative merits of various methods of recording interview responses are also considered in that chapter, and a description given of the procedure adopted in the present study.)

CHAPTER TWO

THE PILOT STUDY

Design of the Interview Schedule

As explained previously, the pilot study was intended to be an investigation of the home environment correlates of early reading achievement in a working class population. Information was to be gathered on the main categories of variables previously known to be correlated with achievement level, as well as on other home environment factors not previously studied in this context.

Established predictors:

The review of the literature described in Chapter 1 had in fact yielded very few concrete examples of home variables which could be said to be established predictors of achievement, as opposed to strong possibilities or favoured theories. Demographic variables, measures of mothers' language behaviour, and measures of parental interest and educational aspirations were the strongest candidates, so it was planned to include questions about them in the pilot interview schedule.

Following the lead of previous large-scale surveys (Douglas 64, Morris 66, C.A.C.E. 67, Rutter et al 70, Davie et al 72,) information was also sought on the

demographic indices of social class, family size - including birth order and number of sibs, family circumstances, and whether or not the mother went out to work.

The index of parental aspirations adopted was that of desire for the child to stay at school beyond the legal minimum age. This was one of the measures used in the Plowden Survey (and by Douglas,) the other being parental preference for type of secondary school to be attended, a measure which has lapsed in usefulness since the advent of comprehensive education. As a measure of parental interest, the Plowden Survey asked whether parents had ever had a talk with any of their child's teachers about him. The phrasing of their questions suggests that they had fairly formal encounters in mind. In the belief that the chosen style of interaction for many working class mothers would be a quick chat at the school gate at 3.30 p.m. rather than a formal appointment, it was decided to ask mothers first if they were familiar with the teachers at school, and then to expand on the nature of the encounters. Asking directly about 'talks' with school staff was not considered appropriate for a working class sample: while mothers who had organised such 'talks' would reveal the fact when expanding on how they came to know the teachers, mothers whose only contact was of the 'chat' variety would perhaps fail to see its relevance and importance in such a context.

Since the ideas for all the above questions, if not their precise wording, were taken from previous studies, the Plowden Survey in particular, further details, including

the exact wording of each item, have been consigned to Appendix 1.

No such precedent existed for indices of mothers' language behaviour. Time was not available in the Pilot for lengthy questionnaires on language, or any other single aspect of mothers' behaviour, so the index adopted had necessarily to be rather crude. Eventually, after studying the scales devised and used by Bernstein's own research team (Brandis & Henderson 70,) it was decided to seek answers to just one question - how willing was the mother to chat to her child, as opposed to listening impassively, or actively discouraging conversation. This one question was believed to sum up one of the Bernstein scales - his 'chatter' scale, which sought to establish how willing a mother was to chat in a number of different contexts, while this scale in turn was judged to reflect a very general aspect of the Bernstein thesis. The exact wording of the interview question used is given in Appendix 1.

Potential predictors:

The remainder of the pilot interview was a search for other predictors of school achievement. It drew heavily on existing ideas about influences on attainment, such as the 'cultural characteristics' of a child's home, the extent of play experiences afforded to the child, and so on. It also drew from the literature on social class differences in child-rearing practices, from the compensatory education literature, and from a study by Morris of the home background characteristics of good and poor readers.

(Morris 66.) These sources will be considered in detail later in this section.

One general theme underlying the planning of the pilot interview should first be expanded upon, however. All of the home environment variables referred to so far are of recognised educational relevance. In addition to these, it was decided to study other variables - certain child-rearing practices, for example - which could be shown to discriminate amongst members of a working class population, and which could be classified along a dimension of 'middle-class-ness.' The aim of this exercise was to see if children who had been brought up in more 'middle-class' ways were more successful in school. The reasoning behind this idea was as follows : children from middle-class homes, it is often said, have an advantage over working class children in school because their upbringing has led them to acquire the attitudes, interests and skills necessary to fit into the 'culture of the school.' Some working class children will have an upbringing which is similar to the middle-class model in certain relevant respects: these children will as a consequence fit more readily into school than the rest of their working class peers, and will be more likely to succeed there. If more was known about which aspects of a 'middle-class' upbringing were of help in fitting into school, and which were irrelevant, then it would be a relatively simple matter to look for those aspects in working class homes, and then to see if the family's degree of 'middle-class-ness' on this index was related to the success of the children in school Unfortunately,

this knowledge does not exist; hence the present study strategy of looking for a relationship between any 'middle-class' upbringing characteristic and school achievement, with an open mind being kept as to which variables might be important and which irrelevant.

Pursuing these ideas a little further, it will be seen that two 'unknown quantities' may be distinguished - the relevant behaviour of the parents, and its effect on the behaviour of the child. Making these ideas more specific, it is here suggested that the ways in which a 7-year old child spends his out-of-school hours are a product, not only of the child's personal qualities, but also of the conscious and unconscious pressures put on him, particularly by his mother, as she shapes his behaviour in the direction of what she believes a child of his age should be like - how he should spend his time, with whom, the sorts of activities which should and should not interest him, and so on. It is further suggested that some of the 7-year old end-products of this process (and of course, the 5-year olds they once were) will cope more easily than others with the demands of school. Children who are used to certain sorts of interaction with adults, who are used to spending their leisure time in activities requiring thought and concentration, children who have been disciplined by verbal and not physical means - these children could perhaps be expected to fit more easily into the 'culture of the school.'

It was planned to ask questions about both of the 'unknown quantities' distinguished above. The interview items designed to investigate aspects of the mother's

behaviour were, in general, based on the child-rearing literature,while questions about the child's out-of-school activities drew more heavily on descriptions of the 'disadvantaged child' in the compensatory education literature. Further details are given under the relevant headings below.

Source 1 Studies of home background influences on attainment, including the Morris study of 'good' and 'poor' readers

As the title suggests, studies in this section were designed from a specifically educational point-of-view, i.e., they began with school achievement and sought correlates in home background variables. Many such studies were content to use social class as an 'explanation' of home influences, while of those which went further, a number were satisfied with assessments of parental attitudes and aspirations as their only intervening variables. A few studies also looked at indices of the 'cultural level of the home,' such as the number of books in the house and the type of newspaper read. The theme of 'parental interest in education' was also a common one. (See section on 'established predictors'.)

In the present study, it was decided to use the ideas of the 'cultural level of the home' and 'parental interest in education' in extended and modified form.

It was planned first of all to obtain information on the 'reading model' provided by the parents - did either or both parents read themselves,and what sort of reading matter was involved? A straight count of the number of

books in the home was ruled out as an index of 'cultural level,' on the grounds that, in a working class sample, it might be difficult - and sensitive - information to obtain. It might also be misleading: a few books on dressmaking, or do-it-yourself, sitting untouched in a child's home are unlikely to stimulate interest. More probably, they will be ignored completely, or worse still, create the impression that reading is a waste of time. The pilot interview was intended to be exploratory and open-ended, however, so the option always existed of following up a particular question. If, for example, a mother was to say that she read a lot of books, it was planned to pursue this further, and ask what sort of books - paperbacks, or library books - and also what the books were about.

Considering next the subject of parental interest in education, it was decided to add two new indices onto the traditional 'contact with school' and 'familiarity with teachers' list. The first of these was to find out if the mother was interested enough in her child's school day to talk about it with him when he came home, or whether she felt she heard too much about school, and discouraged him from bringing her school news. The second was to find out how familiar the mother was with the work her child was doing in school. A fairly strict operational definition of 'familiarity' was wanted here, in order to discriminate the most actively interested of all: enquiries were, therefore, made as to whether the mother had ever deliberately sought information about some aspect of her child's school work, not necessarily from the school, but from some purposefully selected 'expert' source, such as an acquaintance or relative

who was a teacher.

The Morris study of reading performance (Morris 1966) was unusual in that its author elected to use active parental involvement in school work as her index of 'interest in education.' Specifically, the index used was whether or not parents 'encouraged' their children's reading by listening to them read, and reading and telling stories to them. It was decided to find out in the present study if a child did any reading-related activities with his parents at home - did they read to him, or he to them? (N.B. The respondents in the Morris study were the children themselves. In the present study, the information about home reading was to be obtained from the children's parents.)

The exact wording of all these questions, as they were used in the interviews, is given in Appendix 1, while a general discussion of the problems of phrasing interview questions is to be found in a later section of this chapter.

Source 2 The literature on 'disadvantage' and the need for compensatory education.

The disadvantaged children described in the American literature are, it appears, a more extreme group presenting more extreme problems than children from the lowest social class group in the United Kingdom. Findings may not be applicable. One idea did seem to generalise well to British class differences, however, and this was, simply, that the overall amount of interaction which a low social class child has with adults is really very limited. (Keller 63.) This idea is clearly in accordance with the argument developed earlier about the factors that influence

how well a child fits into the 'culture of the school.'

Some means of assessing out-of-school adult-child interaction was needed, but few clues were available as to the most pertinent questions to ask. It was, therefore, decided that a better way of getting this information would be to ask for a detailed account from mothers of how their children usually spent their time after school and at weekends. It was planned to take special note of how much time the child spent in company of adults, and the levels of interaction engaged in: this was to be achieved by recording the actual nature of the activities described, then deciding post hoc the levels of interaction they represented. Laying down criteria in advance of data collection was not believed to be possible in this instance, because so little was known about the range of activities likely to be encountered.

It was envisaged that an account of out-of-school activities would also provide information on the amount of time a child spent indoors engaged in types of play activity which would require him to sit still and concentrate.

After reading Chazan's report of the Swansea 'compensatory education' project (Chazan et al 71,) it was decided that answers should be sought to three questions in particular, during the account of out-of-school activities. These questions were concerned with the degree to which a mother supervised and monitored her children's play activities. Close supervision of leisure hours is known from previous research to be a characteristically middle class child-rearing practice. (Newson & Newson 1968;

other studies reviewed in Klein 1965.) It also has face validity as an index of the amount of conscious thought and planning brought by a parent to the task of bringing up children.

In the Chazan study, questions were asked on the leisure-time activities of children; in particular, their play patterns (where, with whom, with what,) television viewing and activities with adults outside the home, such as going shopping, or visiting friends.

Translated into the particular interest of the present study, these questions took the following form:-

1. What were the restrictions imposed by the mother on the child's play? Could he play where he liked? With whom he liked?
2. Did the mother impose restrictions on the amount or content of her child's TV viewing? At the other extreme, did she ever indiscriminately use the TV as a means of distracting her children, and thereby free herself from the problem of having to occupy them?
3. Did mothers who took their children on child-centred outings also interact with them at home in a child-centred way? In particular, did they ever play with their children at home?

It was planned to obtain answers to questions 1 and 3 above by asking any necessary supplementary questions, in the course of obtaining the account of out-of-school activities. Question 2, it was anticipated, might not arise naturally in the course of a descriptive account: specific questions were therefore designed to cover the issues raised in that section.

As before, wording of all questions as used in the interviews is given in Appendix 1.

Source 3 The literature on social class differences in child-reading practices

Included under this heading are, first, descriptive sociological accounts of the lives of working class people, which touch in passing on the lives of working class children (Young & Willmott 1957, Willmott & Young 1960); and second, studies of child-rearing methods which incorporate social class comparisons. (Newson & Newson 1968, Klein 1965.)

As was pointed out in an earlier chapter, the chief contribution of the descriptive sociological literature on the culture of the working class was to draw attention to the role of the father in the upbringing of children. In the present study, it was decided to focus on paternal participation during the account of out-of-school activities, and in addition to ask specific questions about the attention given to a child by his father, and about the sorts of things they did together. It was planned to relate father participation to other aspects of the home environment, as well as to the school achievement of the children.

Turning to the specifically 'child-rearing' studies, many of the topics covered by them have been previously discussed here under other headings - as indices of the 'cultural level of the home' for example. One marked social class difference, which they in particular describe, however, and one which seems plausibly related to 'fitting in to school,' is the preferred disciplinary method used

by a child's parents. (Newson & Newson 68, Klein 65, also Sears, Maccoby and Levin 57, Kohn 59, Miller & Swanson 58.) The lower a mother's social class, the more likely she is to use threats or physical force to secure 'good' behaviour from her children. The higher her social class, the more likely she is to use persuasion rather than compulsion to achieve this end. In the present study, it was decided to ask specific questions to ascertain a mother's favoured method in this respect.

In psychology, punishments and threats are only one side of the coin when it comes to shaping behaviour. The other side is the use of positive reinforcement. 'Parental encouragement,' so often mentioned as being important for success in school, might seem to be the practical version of this idea. However, none of the major studies reviewed here considered the particular manifestation of 'parental encouragement' suggested by the analogy of 'reinforcement,' namely, does the mother praise her child if he brings her good news of his progress in school? Even in a family which did not place high value on educational success, it might be expected that a mother would respond to her child's news with a token, "That's good." To suggest otherwise seems unthinkable by middle class standards. The mothers of interest, therefore, would be those whose response to 'good news' was anything beyond the minimum, i.e., anything more than a basic, "That's good." It was decided to find out more about the range of responses given by mothers in this situation and to see if differences could be related to

school achievement, or to social class.

Once again, the wording of all questions as actually used in the pilot interviews is given in Appendix 1.

Summary of topics to be covered in pilot interview

In brief summary, the topics to be covered were:

(a) Demographic information - social class, family size ordinal position, mother working and usual/unusual family circumstances.

(b) How the child spent his time out of school, with particular reference to the amount of interaction with adults, amount of supervision of play by the mother, outings, the role of the father in the children's upbringing, and TV viewing.

(c) Parental aspirations.

(d) The 'reading model' provided by the parents and the sort of reading matter involved.

(e) Help with reading at home.

(f) Parental interest in education, in terms of familiarity with teachers and school work, and also of willingness to talk to child about school.

(g) Disciplinary methods used in the family.

(h) Mother's use of praise for progress in school.

(i) The language behaviour of the mother, in the specific sense of her willingness to chat to her child.

General issues relating to the design of the interview schedule and the conduct of the interviews.

The questions in the pilot interview schedule were open-ended. Mothers' answers were to be recorded verbatim, and classification of responses into categories for the purposes of description and analysis was to take place post hoc, on the basis of distinctions found in the data. Three qualifications must be made to this statement, however.

Firstly, the dimensions of difference under each heading were always specified in advance; for instance, more or less supervision by a mother of her child's play activities. What was not believed to be possible in the state of knowledge at the time was to specify in advance the expected nature of the actual behaviour corresponding to the extremes of these dimensions. How much supervision of children's play is 'a lot' in a working class area? How involved is the most involved father in the upbringing of his children?

Secondly, when it came to testing home environment factors against school achievement, it was always possible to specify in advance the presumed 'favourable' end of each dimension. The highest level of paternal participation was hypothesised as being the most educationally favourable, for example.

Thirdly, for some questions, it was possible to be more specific, and state in advance that responses beyond a certain minimum were being sought, e.g., praise for good news over and beyond a token "That's good" was looked for.

After drawing up the list of topics to be covered in the pilot study, it was necessary to plan the order and precise wording of the questions asked. The phrasing of each question was very carefully thought out, in order to minimise, as far as could be judged, any suggestion of a right or wrong answer. The solution usually adopted was to suggest alternatives, designed to sound equally acceptable. For instance:

> "Do you ever enjoy a book or magazine nowadays, Mrs. M., or would you rather relax with the television?"
>
> or
>
> "I know N. is only seven now, but have you thought about when he's older - would you like him to stay on at school at all, or do you think he's a bit young to say just yet?"

The core of the pilot interview was a series of carefully phrased direct questions of this type, together with an equally carefully phrased enquiry into the child's out-of-school activities, with supplementary questions being designed to be used as necessary, if all the topics of interest were not covered spontaneously. All these questions were asked in identical form in each interview.

The questions were arranged in an order which was judged to be both plausible, in that awkwardness in going from topic to topic was avoided, and minimally threatening, in that the most neutral information was sought at the beginning, e.g., family size and children's play activities, moving gradually on to the potentially more emotionally loaded topics, such as discipline, later in the interview. In general, this order was adhered to, unless a topic arose naturally at an earlier time, in which case it was followed up then.

Recording of verbatim responses was a fundamental feature of the pilot study plans. A decision had to be made, therefore, as to how this should be done. In their study, the Newsons used tape recordings, which were later transcribed. Disadvantages of this method are that it may have an inhibiting effect on the respondent, and that it increases the amount of time required to collect and code the data. Three interviews, each an hour long, mean, at the very least, three hours of playing back the tapes and transcribing the conversations. The undoubted advantages are that tape recording captures virtually all the verbal information given by the respondent, and that the record can be examined as often as is necessary. Some information will be missed, however; smiles, head shakings, nuances of intonation. If transcribing lags behind recording, this information will be forgotten and lost.

Primarily on the suspicion that a working-class respondent would be particularly inhibited by the idea of being tape-recorded, it was decided to record the interviews by means of written notes. In order to facilitate this procedure, in terms of the time available to write down all that was said, it was decided to add extra questions into the interview schedule, to act as 'padding.' This system worked as follows:

One of the 'core' questions was asked and a reply was given. If the reply was still being written down after the respondent finished speaking, a 'padding' question was asked, seeking information which was not required, but which served to maintain the flow of conversation, while

the note taking was completed. For instance, if a mother said her husband took the children 'over the park' on Saturdays, details could be sought as to the exact location of the park, the need for open spaces, and so on. With practice, it was found to be quite easy to choose a 'padding' question which would require a lengthy answer, and so enable full notes to be taken of the preceding 'core'response.

The other function of 'padding' questions was to link the various 'core' items into a more plausible flow of conversation. For this reason, a number of 'padding' questions were included routinely. They are listed and indicated in the description of the pilot interview given in Appendix 1.

Necessary planning for the pilot project was considered to be completed at this point. The collection of the pilot data is described in the section that follows.

The Sample and Data Collection

While the plans for the pilot interview were being worked out, negotiations were proceeding with a series of Local Education Authorities in Outer London Boroughs, for permission to use some of their primary schools in the study. The only specification which had been made was that the schools needed to be in as uniform a working class area as possible.

The third LEA approached, that of the London Borough of Barking, agreed to participate in the project, and supplied the names of suitable schools for each stage of the study.

For the pilot project, two schools containing top infants had been requested. As described previously, children of about seven years of age had been identified as the target population for the study. Since the pilot was to take place in the school summer term, final year infants were chosen as the nearest to this in age. The LEA supplied the names of two heads whom they had approached, and who felt they might be prepared to co-operate. Both these heads were contacted, and given full details of the project, and both willingly agreed to participate.

The method used by the LEA in selecting these schools was unknown, but presumably contained some element of bias, in that heads might be chosen who were known to be interested in research, or generally co-operative in other respects. Since differences in children's homes were to be the focus of the present study, the possible untypicality of the schools, as opposed to their catchment areas, was not

of critical importance. The possibility of complex interaction between type of home and type of school could not be excluded, however. The non-random nature of the sample of schools was therefore taken into consideration when examining the findings of the study.

The two schools used in the pilot study differed between themselves in a number of respects. One was a very small, infants-only school; the other was a considerably larger J.M.I., with the extra feature of having a unit for partially-hearing children integrated into the junior sector. The small school was vertically grouped, and had a staff of three mature women; the large school was conventionally grouped, with a staff of perhaps six young teachers of both sexes. In the latter school, there were two final-year infants' classes. More precise information was not sought from these schools, on the grounds that it was not relevant in a pilot study of the present, very exploratory, type.

The catchment populations of the two schools were very similar, in that both were uniformly white and working class. According to both Headteachers, the proportion of 'families of immigrant origin' in their areas was less than one per cent - a remarkably low figure for London.

In other respects, the two areas were less similar. The small infants school (School L) was in a new purpose-built building on the very edge of a large council estate, the boundary of which was in the process of being pushed farther out into the adjoining fields by the erection of new blocks of 'walk-up' flats, (i.e., no more than four storeys.) The school catchment area included these new

blocks (all, incidentally, built for the council,) as well as a larger area of 1930's council houses. The new blocks in particular contained a high proportion of young families with children of primary school age. In the Borough of Barking, with its good housing record, these families were given their own council homes as soon as their first child was born.

> "You go along to the council with the baby's birth certificate, and they give you the keys of your flat."

as one interviewee was later to describe the procedure. As a result of this policy, there was no overcrowding nor multi-occupancy in the area, and the material standard of the council property was very high. (Fuller information about these factors is given in the section which follows.)

It was recognised that the above features made the area atypical of London working class districts, especially those in Inner London Boroughs, with their records of poor housing and generally inadequate material conditions. Poor material circumstances and overcrowding in a child's home have been shown to be correlated with his progress in school (Davie et al 72) although presumably via a complex network of mechanisms. It has been suggested (Rutter et al 70) that poor material circumstances are probably more usefully regarded as "indicators of a social environment which is deficient in other respects" than as causative factors per se of educational retardation. To the extent that families providing 'deficient' environments in slums will also provide them in council houses, then the findings from Barking may be generalised to urban working class areas. To the extent that material circumstances do themselves influence school progress - indirectly via the

health and attendance records of a child, or via poor sleep due to sharing a bed - then findings from Barking may not be applicable to other working class areas. At the present time, research does not exist which would enable this question to be answered.

The catchment area of the second school used in the pilot study (School E) was in a slightly less favourable environment. The housing was entirely council property, as before, but this time all much older buildings, put up in the 1920's, as was the school. The area adjoined the local urban centre, instead of fields, and generally gave the impression of being much more 'built up' and very much shabbier than the area around School L. Another significant feature was that the catchment area of School E contained two local authority 'halfway houses' - tenement-like blocks of flats, which provided temporary accommodation for homeless families, women who had left their husbands, and so on. (It should be added, however, that these homes, while inferior materially to those around School L, all had basic amenities and there was still no overcrowding.)

Taking together the two factors of older property in general, and halfway houses in particular, the result was that the population in this area was somewhat different from that in the area round School L. The older council houses tended to contain older residents who had lived there for many years. Young families were more scattered. In addition, there was a high proportion of 'atypical' families, to borrow the expression used by the Naticnal Child Develoment Study to describe families in which the child was not living with both his natural parents (Davie et al 72.) The

halfway houses, of course, contributed to this, the other 'atypical' families being those in which one of the older residents of the district, described above, acted in their capacity of grandparent, and cared for a grandchild whose 'nuclear' family had broken up. (The precise numbers involved here are described in a later section.)

School L. had 36 final-year infants on roll; School E. had 46. It was decided to attempt to interview the mothers of all these children, i.e., the sample was to be all the final-year infants in two schools, with the original selection of the schools remaining a non-random factor. (While it would have been extremely interesting to interview fathers as well as mothers, the practical difficulties of catching fathers at home made this an impossibility in the present study.)

Two types of data collection were to be arranged - the testing of the children's reading, to take place in school, and the interviewing of the mothers, to take place in their own homes.

The reading testing

After consultation with the Headteachers, it was arranged that the reading tests be administered by the schools. This was the Heads' preferred choice, on the grounds that such young children would take testing by a familiar teacher more in their stride than testing by a stranger. Since the reading test chosen, the Southgate, is a group test, with strict instructions to the tester to provide no assistance, and since there was never any

suggestion that the teachers mark the tests, it was decided that this was an acceptable arrangement. The Southgate test was completely new to the school staff (and to the children,) so full consultations were held as to its administration, then the schools were left to test the children, at their convenience, some time in a specified two-week period. The completed tests were then collected and marked by the research worker. Details of the testing procedure for the Southgate are given in Appendix 2. The schools found this procedure straightforward and reported no difficulties.

The home interviews

A brief letter on school notepaper was sent home with each child in his final year in the infants, explaining that a survey was taking place in the area on the upbringing of children. The letters were addressed to the children's mothers, and individually headed.

The purpose of using school notepaper was to prove authenticity, in the belief that being mistaken for a seller of encyclopaedias would be a worse handicap than an association with the school. This latter association was played down in the letter itself, which stressed that the 'survey' was nothing at all to do with the school or the Education Authority, but that both had given their permission for it to be carried out. The letter went on to say that the survey was being carried out for the "Department of Child Development at London University," and that the interviewer would call sometime in the next few days, to explain more about it and to ask permission to carry out an

interview.

Letters were sent out first from School L. and the interviewing completed in that area, before moving on and repeating the procedure with School E.

Thirty-six letters were sent out from School L, and each home visited at least twice. On the first visit, the interviewer merely explained who she was, and repeated that the survey was nothing to do with the school authorities, and that they had not sent her. Attempts were made to put the mother's mind at ease about any other worry she may have had, for instance that her child had been selected because of some misdemeanour, or poor performance. A request was then made for permission to return at some later date and carry out the interview, adding that the time taken might be up to an hour. All the women asked agreed to be interviewed, and appointments were made for the earliest convenient time. All but three of these first appointments were kept and the interviews successfully completed. The remaining three were contacted again, and the interviews carried out either on that visit (2), or at a second appointed time (1).

From School E, forty-six letters were sent out. One mother (from a halfway house) moved away before she could be contacted, and of the remaining families, 35 were interviewed successfully. Of the 10 mothers who were not interviewed, 3 refused and the other 7 broke all their appointments. Of the 35 successful interviews, only 2 needed a second appointment.

After five weeks, when 71 women had been interviewed, no further attempts were made to catch the persistent appoint-

ment-breakers. It was decided that, in an exploratory study, the risk of biassing the sample sufficiently to be mis-leading was not large enough to justify the time and effort which would be required to chase up every possible interview right to the very end. As it was, a great deal of time had been wasted by only being able to arrange a limited number of interviews in a day. If each had to be scheduled to take an hour, it was not possible to fit more than one in a morning, for instance. Starting an interview at 10.30 a.m. and finishing it at 11.30 a.m. would mean a wait of perhaps two hours until the next feasible time for another appointment in the early afternoon. Add to this the time wasted in broken appointments and it will be seen that the return for effort in interviewing even co-operative women was so low as to make the pursuit of unco-operative ones an unacceptably inefficient venture.

The interviews themselves took anything from thirty minutes to three hours. The question of the validity of interview data has been considered elsewhere. Sufficient then to say here that great efforts were made in the actual interview situation to establish and maintain a friendly conversational atmosphere. Tea drinking, photograph-admiring and deviating wildly from the interview schedule if the mother wanted to discuss a particular theme - all these were considered valid and worthwhile means to achieve this end.

Most mothers took a very lively interest in the interview, and were more than willing to answer all the questions asked. A number went so far as to comment, at the end, that they had really enjoyed "the chat," and

invitations were proffered to "call again whenever you're in the area." Even the least talkative women seemed perfectly prepared to answer all the questions and no objections were voiced to the interview content. As far as could be judged, the interviewer's note-taking did not appear to be at all disconcerting, as long as the flow of conversation continued without interruption.

Of the women interviewed, four were not the natural mothers of the child in question. All were helpful and willingly told what they knew, but their information did raise special problems, which are considered at length in the section which follows.

Coding of the Data and Descriptive Statistics

The completed sample

In all, interview data was obtained from the homes of 71 children, 36 from School L, and 35 from School E. The School L. figure represents all the children on the roll who fell into the relevant age group. The School E. figure represents a success rate of 35 out of 45 (46 on roll, but one left the district.), i.e., nearly 80%.

Unfortunately, however, not all the 71 interview protocols were believed to be usable. As mentioned in the last chapter, four of the interviewees were not the natural mothers of the sample children. There were three grandmothers, and one stepmother, whose very complex domestic situation involved two of the sample children.

Had certain criteria been met, these families would have simply been coded 'atypical circumstances,' and included in the analysis. The criteria were that the respondent be the child's principal care-taker for seven days a week, and that she had been so since the child had been at school. These qualifications were introduced as a result of knowledge gained in an early interview, which was that the child in question spent Monday to Friday in the home of his grandmother and the weekend in the home of his natural mother and her second husband, some twenty miles away. It was the grandmother's home which was in the catchment area of the project school, so it was she who was interviewed. While perfectly willing to describe how she brought up the child during the week, she had really very little idea of what he did at weekends,

over and beyond hearing that "she'd taken him to the swimming baths," or similar major events.

It was decided that such cases must be excluded from the present study as the children were being exposed to influences and experiences which could not in any way be assessed or allowed for. Two children, other than the one already described, fell into this category, the pattern being very similar in all three cases ; broken marriage, mother working long hours or far away, grandmother taking over and having responsibility for the child a large part of the time.

The remaining interviewee, who was not a natural mother, was excluded from the sample on the second of the two criteria given, i.e., that she had only had charge of the child for a relatively short period of time. To be precise, two children were involved, both in the sample, and neither had been in the care of the lady in question for more than nine months. The children were half-brother and sister, offspring of the father's two previous liaisons, but only one of whom had been in the care of the father prior to his most recent marriage. The situation was judged to be sufficiently complex to be beyond disentanglement, and both children were excluded from the sample.

One other child was excluded on the first criterion. He lived with his natural mother during the week, and his father every weekend, and a lot of the time in the holidays. He had also spent some time in a foster home.

The sample size was now 65, but unfortunately, was to drop by two more to the sample of 63 on which all the ana-

lyses are based. These two were children for whom no reading score could be obtained. Before he could be tested, one child went into hospital for a lengthy course of treatment for eczema - a condition which had in any case kept him away from school for long periods. The second belonged to a family which had only arrived from South Africa six months beforehand. One of the youngest children in his year, it was the school's view that he was handicapped by only having begun school in South Africa when he was six, and also by his strong emotional reaction to the upheaval of the move. The school staff were unable to persuade him to co-operate in the reading testing, even on an individual basis.

In the original sample of 82 names from the two school rolls, there had been 56 girls and 26 boys. In the final sample of 63, there were 43 girls and 20 boys, 19 girls and 12 boys from School L, and 24 girls and 8 boys from School E.

The home interview data

The present study was exploratory, rather than being designed to test existing hypotheses. Efforts were still made, however, to be as scientifically rigorous as possible, in that the interview data were collected and coded into preliminary categories before the reading tests were marked. This was considered to be particularly necessary in a study of this type, where the criterion variable, i.e., the reading test data, could be scored in a much more objective manner than the home interview data.

What was not possible was to specify in advance of

collecting the interview data, the precise categories into which it was to be coded. Dimensions of difference were specified in advance, and so were the 'favourable' ends of those dimensions, but with a few exceptions, it was not considered advisable to describe cutpoints, or criterion behaviours, for categories, in the light of the very limited knowledge available at the start of the study.

Decisions about categories and coding systems for the interview data were therefore not made until all the interviews had been completed and the range of relevant behaviours and attitudes made known. The reading test data were not marked until the essential stages of this process had been completed, as described in more detail a few pages further on.

The total body of information obtained from the interviews was classifiable under three headings:

(a) Demographic information, for which coding systems could very largely be specified in advance.

(b) Information from direct questions.

(c) Information from the mother's account of the child's leisure-time activities.

Each of these will be considered separately.

(a) Demographic information

The variables considered were social class, family size indices, mother working, and normal/atypical family circumstances.

Social class

During the interviews, sufficient information was obtained from respondents to enable head-of-household's occupation to be assigned to one of three groups, based on the Registrar General's scheme for the classification of occupations - 'non-manual,' 'skilled manual' and 'semi- or unskilled manual,' i.e. IIINM, IIIM and IV + V, to use the most common notation. Three families had no male head of household. All three women were receiving Social Security payments and none of them had, or ever had had, a job themselves. For the purposes of analysis, these three were all placed in the lowest social class grouping.

It was soon apparent that the label of 'homogenous working class area' was a valid one for both the school catchment areas considered, as can be seen in Table 2 below.

TABLE 2

SOCIAL CLASS BY SCHOOL

	IIINM	IIIM	IV + V	
SCHOOL L.	9	9	13	31
SCHOOL E.	5	12	15	32
	14	21	28	63

The fourteen families which were not, strictly speaking, 'working class,' had heads of household who ran their own business, such as TV repairing, or small-scale engineering, or who were salesmen. Three fathers in this group followed a clerical occupation - one worked for the Gas

Board, one for an hotel, and one for an insurance firm, all as 'clerks.' No father in the sample belonged to social class I or II.

The III manual group contained a carpenter, a bricklayer, a toolmaker, a number of foremen, mechanics of one sort or another and drivers of coaches, heavy goods vehicles and ambulances. Drivers formed the largest single group - 8 men out of 21 in the group.

In the 'semi- and unskilled' group were included foundry labourers, packers, paint sprayers, plant attendants, maintenance workers for the local council, yard staff for lorry firms and a dustman.

Out of the final sample of 63, nine men worked at the Ford Motor Company's large plant in the vicinity - the plant which has made the names 'Fords' and 'Dagenham' almost synonymous in the minds of many people. Nine out of 63 is a large proportion, but not as high as had been expected as a result of the popular beliefs about Dagenham. Further investigation revealed that, of these nine, six were in the 'semi- or unskilled' category, i.e., they were foundry labourers, or paint sprayers, or similar.

At the end of one or two particularly informative interviews, towards the end of the study, when the above fact was becoming apparent, enquiries were made as to where the Ford Motor Company's enormous numbers of skilled workers lived. Not one skilled machine operator, or mechanic working at Ford's had been found. The reply was that Ford's skilled workers were "too well off to live in Dagenham - they've all got their own houses in Chingford or Romford," the last-named being somewhat 'up-market' residential

areas, centred on old villages, rather than the artificially created sprawl of the Dagenham estate. The idea of Dagenham as an estate peopled by the employees of the Ford Motor Company would, therefore, seem to be out-of-date.

Table 3 shows the social class distribution of the present sample, of a national sample of fathers of primary school children (Plowden Report No. II - C.A.C.E. 1967) and of the economically active males in the London Borough of Barking (Greater London Council figures - Thomson 1972.)

TABLE 3

The social class distribution in the study sample compared to national and Barking standards

Social Class	Present study (% approx.)	GLC - Barking %	England 1964 %
I + II	0	8	18
III NM	22	20	11
III M	33	39	48
IV + V	}	}	22
	} 45	} 33	
Not known	}	}	1
	100	100	100
No. of cases	63	54,590	3092

From inspection of this table, it may be seen that, while the social class distribution in the present sample is markedly different from that in England as a whole, it

fits more closely to that found in the London Borough in which all the sample families lived. The presence of a small number of professional or managerial families in the GLC Barking figures, while none were found in the present sample, is explained by the heterogeneity of Barking taken as an entire Borough. Owner-occupied property was concentrated in two or three circumscribed areas of the Borough, none of which was even near the areas used in the present study. Similar considerations presumably apply to the over-representation of the lowest social group in the present sample.

Performing χ^2 tests on samples of such disparate sizes was not considered to be a useful exercise, particularly since even the GLC distribution could be expected to differ from that of the pilot study for the reasons given above.

The discrepancy between the present sample and GLC distributions was found to be in the expected direction, and also of a plausible size, so it was considered unlikely that the figures were giving a seriously misleading impression of the class composition of the areas in question.

Family size: The obtained figures were as shown below.

TABLE 4

Distribution of the 'family size' variable

		1	2	3	4	5	6	
Total family size	N	4	23	21	10	3	2	
	%	6.3	36.5	33.3	15.9	4.8	3.2	} rough guides only

Collapsing some cells, it may be seen that about 24% of sample subjects were in families of four or more children; about 70% came from families with two or three children, and a little over 6% were 'only children' (the last figure being the most unreliable estimate, owing to the small number of children involved.) The National Child Development Study figures corresponding to these were 30%, 61% and 9% respectively, based on a sample of over 15,000. (Davie et al 72.)

This study also found "the expected social class trend, middle class families tending to be smaller than working class families." (i.e., The above NCDS figures are averages, with the working class groups having in fact more than 30% of children in 4+ families.) While the numbers in the present study are too small for firm conclusions to be drawn, it is of interest that this working class sample contains a smaller proportion of large families (4+ children) than would be predicted on the basis of the NCDS findings.

The NCDS children were born in 1958, the present study children about nine years later. A move by working class families towards the smaller unit characteristic of the middle class may have taken place over this period. As was mentioned earlier, material conditions on the Dagenham estate were good, so there was space and facilities enough for large families, had they been wanted. It appears that they were not. Once again, this means that the present sample is marginally different from working class samples previously studied; insofar as large families are associated with low school attainment, the present sample might therefore be expected to be slightly less at a disadvantage in this respect.

(The previous example given was that of the better material conditions in Dagenham than in most working class areas.)

Other characteristics of the biological position of a child in his family, such as his birth order and the number of younger sibs he has, are considered later in relation to school achievement, since both have been shown by the NCDS to be of relevance. For the present then, only the numbers are given from the present study sample:

TABLE 5

Distribution of the 'number of older sibs' variable

		0	1	2	3	4	5
No. older sibs	N	20	28	8	4	2	1
	%	31.7	44.4	12.7	6.3	3.2	1.6

TABLE 6

Distribution of the 'number of younger sibs' variable

		0	1	2	3
No. younger sibs	N	25	29	8	1
	%	39.7	46.0	12.7	1.6

That is, about 30% of the sample children were the eldest (or only) child in their family, while almost 40% were the youngest (or only.) These family characteristics can only be considered meaningfully in relation to their effect on school progress after looking first at the overall family size effect. This was the procedure followed in the

present study; the statistical techniques utilised are described in the appropriate chapters.

Overcrowding

The question of overcrowding in the home may be interpolated here, as a possible consequence of large family size.

According to the definition adopted for the 1961 Census, overcrowding is present if there are more than 1.5 persons per habitable room in a dwelling. The NCDS used this definition and revealed that over 11% of 7 year-old children in Britain were living in overcrowded conditions.

The same definition was used in the analysis of the 1966 sample Census data, presented for the GLC in the report previously mentioned. (Thomson 1972.)

Barking was found to have less than 3% of its households living at a density greater than 1.5 persons per room. The overall density of occupation in the Borough was reported as being 63 persons per 100 rooms.

Barking is a predominantly working class borough, but unlike other London boroughs such as Hackney, which are similar in this respect, but which have a high proportion of privately rented accommodation, 66.8% of households in Barking live in houses or flats rented from the Local Authority. In the present study, all families interviewed lived in Council accommodation, all of which had the three basic amenities of a hot water supply, a bath/shower and an inside toilet. Furthermore, as the number of children in a family increased, it was the Council's practice to move that family to a larger house.

The largest families in the present study had 6 children. At a density of 1.6 persons per room, a household of eight persons would be overcrowded with five rooms. A council tenant with six children was given a four-bedroom house (i.e., six rooms,) so even if a grandparent moved in as well, the official overcrowding limit would not have been reached. (Six rooms at a rate of 1.6 persons per room need 9.6 persons to be overcrowded.)

As the Census data shows, overcrowded homes do exist in the Borough of Barking, but none were found in the present study sample.

Douglas (1964) found that, within the working class, and after allowing for family size, parental interest and the academic record of a child's school, unsatisfactory material conditions at home still had a "progressive and depressive" influence on children's performance. Whatever the explanation of this finding (see previous discussion on pages 87-88 ,) the fact remains that the unsatisfactory material conditions which Douglas found in three-fifths of his working class sample are not shared by the families in the present study. It must be recognised, therefore, that home factors which are related to school success in Dagenham may not be so important when placed in the context of a less favourable material environment.

Mother working

Out of the 63 women in the pilot sample, 11 were in full-time employment, 25 worked part-time, and 27 did not go out to work, i.e. three-fifths of the sample were in some form of paid employment. The comparison of these

figures, in approximate percentage terms, with those obtained in the NCDS is given below.

TABLE 7

The distribution of the 'mothers working' variable in the present sample compared to a national standard

	Full-time	Part-time	Not at work
Present study	17%	40%	43%
NCDS	9%-10%	34%	56%

The Barking figures are clearly higher, for both full- and part-time workers.

Systematic information was not collected in the pilot study on the sort of work the women were doing. Unsolicited information revealed factory workers, shop assistants, school meals' attendants and a 'lollipop lady' (i.e., a school crossing attendant.) Only two women held secretarial jobs. Semi-or unskilled industrial work in particular was widely available on a nearby trading estate, or in the factories along the Thames estuary.

As was reported earlier, 38 of the sample mothers had at least one child younger than the 7 year-old sample child. 27 mothers did not go out to work. The question which obviously arises is: are the mothers who stay at home doing so in order to look after very young children? Table 8 is addressed to this question.

TABLE 8

Mother working by number younger sibs

	No. younger sibs	One or more younger sibs	
Mother not at work	8	19	27
Mother works - PT or FT	17	19	36
	25	38	63

In half of the families with a child younger than the seven year-old in the sample, the mother was holding down either a full-time or part-time job. Only one woman of this 19 was acting as a single parent. (See next section on 'atypical' families.) Enquiries were not made about what happened to the children while the mothers were working. Some may have been old enough to attend school or nursery school. (The latter was mentioned in other contexts as being available on the estate. No mention was made of any other form of pre-school provision.) Grandparents and older sibs presumably played some part in arrangements also.

The pressure of younger sibs only lowers the proportion of working mothers from two-thirds to one-half. This was taken to indicate that a strong positive motivation to go out to work was a feature of the majority of mothers in this sample.

'Atypical' family circumstances

As has already been pointed out, a number of families were excluded from this study at an early stage, because their home circumstances were so 'atypical' as to make data collection unreliable. In the present context, 'atypical' family situations were those in which the child was not living with both his natural parents (the definition used by the NCDS.) Six children had been excluded from the sample for very complex variations on this theme. Six remained in the N = 63 sample whose circumstances were also by this definition 'atypical.' The father of one was dead, and the parents of the other five had separated. All lived with their natural mothers. (The other two excluded children both lived in 'normal' families.) Hence, out of 71 children, 12 lived in 'atypical families.' This figure of 1 in 6, or approximately 17%, is over twice as high as the figure of 7.8% found in the NCDS. Of the six 'atypical' children in the final sample, only one mother went out to work, and she was also the only one with a child younger than seven. The other five 'atypical' mothers had no preschool children, but did not go out to work.

(b) Information from direct questions

The first stage in coding this data was to examine, for each question, the full range of different replies received, and then to look for the 'natural divisions' along that range. Each protocol was then scored according to which of these most natural subdivisions it fell into.

A concrete example will illustrate this process

more adequately than a lengthy description of principles.

The question was asked as to whether or not the mother wanted her child to stay on at school beyond the minimum leaving age. (The exact wording of this question has already been given on page 82.) Replies to this varied from:

> "She'll stay on, alright, if I have to scrub door-steps to keep her there."

at one extreme, to:

> "I think meself they've had enough of school by fifteen - that last year, they just mess about, don't they?"

at the other. Altogether, five categories of response emerged very naturally for this question, the two extremes being indicated by the examples given above. The second 'most favourable' category covered mothers who were keen for their children to stay on, but qualified their enthusiasm by insisting that if their child really wanted to leave for some valid purpose, then they would permit him to do so.

> "For meself, I'd like him to stay on, but it's up to him - if he wanted a trade... You can't force a child, can you?"

Next in order of favourability were mothers who said it was entirely up to the child, but that they, if consulted, "wouldn't mind." The remaining category - second from the bottom - were mothers who had, as yet, no opinions either way. They had given the matter no thought, not even as far as whether they would 'mind' or not. (Mothers who said that they did not know in reply to this question were prompted with the extra question as to whether or not they would 'mind' if their child decided he wanted to stay on. Mothers were only coded in this category if they repeated

that as yet, they did not know.) These mothers were coded 'wait and see,' as opposed to the last group, who had already decided that they wanted their child to leave.

The reply of each interviewee to this question was then coded from 1 to 5 (most to least favourable) according to the type of response they gave. It was always recognised that the categories used were arbitrary, but by following 'the natural divisions in the data,' it was found that very seldom did any question arise about which category a response fell into.

To take a second example: mothers were asked about hearing their children read. They were first asked, "When N was younger, did you ever listen to him read at all?" (After questions about the mother reading to her child.) This was followed by, "Do you ever/still do that now?" Putting together the replies from these two questions revealed a range of practices from, at one end of the scale:

> "Oh yes. We believe in encouraging them. We bought all the Ladybird books. She'd much rather do something with me from a book than play. (Now?) Mm. When I'm working, she'll come out and read, or say, 'Give me something to spell.' So we do - that and reading."

to, at the other:

> "No, not really. I don't think they really learn very much at that age. She's more interested in PT than anything else." (Now?) Not really. I prefer teachers to teach 'em. When they come home, they've had enough for the day."

Altogether, five types of response were distinguished for this question, the two extremes being indicated by the examples given above. While very few mothers claimed never to have heard their children read (only six fell into this

category) quite a lot said that they had listened to him read when he was younger, but did not do so any longer. A few qualified this reply by saying that they still did hear their children read once in a while, an event which quite often seemed to be triggered by the appearance of a reading book brought home from school.

> "They used to give 'em a reading book, and we used to learn her. But now - she very seldom brings books home. I asked the teacher, and she said she's getting on alright - it's not school policy to bring books home, she said. When she does bring a book, we teach her the words."

These mothers were placed in a separate category.

The remaining category consisted of mothers who said that they had listened to their children read in the past, and were themselves still willing to do so: the distinguishing feature of these cases was that the children in question now preferred to read on their own.

> "With reading books, I used to sit with her a lot. We'd go through a book a day. I used to praise her up - 'I want to see a new one next week,' I'd say. (Now?) No, at one stage, she wanted you to listen to her. Not now. She wants to get on with it herself. She reads herself - newspapers, books - not comics."

The reply of each interviewee was coded according to which of the above five categories it fell into - listens to reading often still; used to but now child prefers to read on own; used to and does occasionally still; used to but no longer; never has listened to reading.

The procedure of examining all responses to a question, looking for 'natural divisions' in the data, and coding all protocols accordingly, was followed for all items on the interview schedule. Full details and examples of the various categories are given in Appendix 1. In the main body of

the results to follow, categories will be named, and used as such in analyses, but reference must be made to the Appendix for details of the derivation in each case.

A count was then made for each item of how many responses fell into each of the categories. Table 9 below lists the categories decided upon for each item, the number of mothers whose responses fell into each category, and the approximate percentage of the total (N = 63) represented by each count.

TABLE 9

Information from direct questions

(List D)

	N	% (Rough Guide only)	
1. TV programmes watched:			
Regulated by mother ...	8	12.7	
Random	55	87.3	
2. Amount TV watched if fine weather:			
Saturday morning or less ...	14	22.2	
A little in the evenings also	31	49.2	77.8
A number of hours	18	28.6	
3. Indiscriminate use of TV by Mother to occupy children:			
Disagree; do not do this ...	16	25.4	
Saturday morning, rainy days only	14	22.2	47.6
Agrees; uses TV like this as much as possible	33	52.4	
4. Aspirations for child to stay at school beyond 16:			
Emphatically keen	17	27.0	58.7
Very keen if child is too ...	20	31.7	
Leaves it to child, but 'not mind'	16	25.4	
Says will 'wait and see' ...	6	9.5	41.2
Wants child to leave ...	4	6.3	

TABLE 9... Cont...

	N	% Rough Guide only)	
5. Mother's own reading:			
Reads a lot of books ...	15	23.8	
Says has no time but would like to	13)	20.6)	
Magazine or newspaper only...	24)	38.1)	76.2
Never reads or 'prefers TV'..	11)	17.5)	
6. Father's reading:			
Reads a lot of books ...	10	15.9	
Technical books only ...	11)	17.5)	
Newspaper only	29)	46.0)	84.1
Never reads or 'prefers TV'..	13)	20.6)	
7. Mother's willingness to chat:			
Enjoys chat...	22	34.9	
Neutral	16)	25.4)	65.1
Tells child to stop ...	25)	39.7)	
8. Mother's familiarity with school and teachers:			
Knows teachers and sees them often	30	47.6	
Open days only	28)	44.4)	52.4
Never go to see teachers ...	5)	7.9)	
9. Familiarity with school work:			
Has actively sought information on at least one occasion	19	30.2	
Other	44	69.8	
10. Mother's interest in school news:			
Encourages child to tell her school news each night ...	36	57.1	
Listens but not very interested	19)	30.2)	
Actively discourages news of school	8)	12.7)	42.9
11. Disciplinary method:			
Explaining and coaxing ...	33	52.4	
'Firmness,' i.e. just gives orders	23)	36.5)	47.6
Explicitly physical... ...	7)	11.1)	
12. Mother's response to good news from school:			
Emphatic, make a fuss ...	21	33.3	
Just say 'good'	23)	36.5)	66.7
Unenthusiastic	19)	30.2)	
13. Mother reading to child:			
Do regularly still	25	39.7	
Used to, occasionally now ...	29)	46.0)	60.3
Never have	9)	14.3)	

TABLE 9... Cont...

	N	% (Rough Guide only)	
14. Child reading to mother:			
Does regularly still ...	17	27.0	
Used to regularly, child prefers to read on own now	7	11.1	38.1
Whenever brings schoolbook home - does so now and again...	6	9.5	
Used to in the past ...	27	42.9	61.9
Never has	6	9.5	
15. Attention from Dad:			
Children do get attention ...	26	44.8	
Would if had time, or sometimes	18	31.0	
Not really	14	24.1	55.1
16. Activities with Dad (not necessarily regular.)			
Child-centred	36	62.1	
Adult-centres - the 'Club' or visiting relatives ...	8	13.8	
None	14	24.1	37.9

N.B. Last two add to 58, not 63, because 5 children (from the 'atypical' homes) never saw their fathers.

(c) Information from the mother's account of the child's leisure-time activities.

The above description of coding procedures refers to the data obtained as responses to direct questions. The other body of information obtained in each interview was an account of the child's leisure hours, supplemented by a number of extra 'probe' questions on topics of special interest.

When these accounts were first examined, it immediately became apparent that the original plans for its coding were not suitable, modifications being required in a number of respects.

The plan had been to describe in detail how much time in the evenings and at weekends a child spent with adults, and further, how much of that time was spent on 'child-centred' activities. Information had also been wanted on visits to parks and so on, and how involved the father was in the child's upbringing. While the interviews were being carried out, it became clear that these were not the 'dimensions of difference' which discriminated amongstmembers of a working class community. Rather than seek families with a high level of father involvement, for instance, it was found necessary to think more in terms of families with any father involvement at all, and beyond that, to fathers whose time with their children was spent in physical games and activities, as opposed to seeing men who sat down with their children to play, or to read to them.

There was no need to think out a way of describing the different levels of interaction between mother and child, and calculating how much time in an evening was spent in each. All sixty-three children spent almost their entire evening, every evening, 'playing out,' i.e., solely in the company of other children. Typically, a child would return from school, have a biscuit and a drink of 'pop', and go out to play. He would play outside with his friends until about six, or six-thirty, when he would come in, have a meal and watch TV until bedtime. Sustained concentrated activity with adults was minimal.

The interviews took place in the summer, when the weather was fine and the evenings long. As a crude attempt

to discover how important were these factors in determining the above pattern, mothers were asked what happened if the evening were rainy, and the child had to stay indoors. What was being sought were mothers who joined in their child's play for any length of time, as a means of occupying him perhaps, but nonetheless, taking an active part. What was found was a pattern much as before, for two-thirds of the children, with 'mother participation' not appearing to have any part in the proceedings at all. Of the third for whom such participation was mentioned, however briefly, only two or three could be unquestionably considered to be enjoying 'sustained, concentrated' interaction. The more common pattern was for the child to be roped into household tasks, like helping mother to cook dinner or clean out a cupboard. While interaction between parent and child in such circumstances may well have been quite intense in some cases, it was impossible to judge this from the mothers' replies, and undoubtedly some mothers preferred to 'get on with the job' as usual, rather than take trouble to involve and interest their child. Yet other mothers 'started off' their children in some game or activity, then went on with the housework or TV-watching once they were successfully occupied. This task was made the easier because very few children in the sample were 'only' children - four of them, to be precise. Of the children whose mothers did not 'participate' at all in their evening's activities, most were said to play with their sibs, or to watch television for the course of the evening.

The special topic of visits by the children to places of interest posed no coding problems. 17 children out of the 63 appeared never to go on any sort of outing with an adult at all. For a further 21, outings were restricted to local shopping, or visiting relatives, again invariably within one or two miles of home. 25 children were taken on some sort of 'child-centred' outing, usually to the local park, but sometimes to the swimming baths, or 'over the field to see the horses.'

Only four of these 25 were taken on the sort of outing most educationalists would have in mind, such as trips to Greenwich or the New Forest - "to look at the date line," or "the lovely things in nature." One child was said to have visited a museum, "the one with the dinosaurs - he's been dinosaur-mad ever since."

> (N.B. When the data on outings was first coded, information relating to Saturdays and Sundays was kept separate, on the grounds that working hours of parents and the opening hours of shops etc., might dictate rather different activities on the two days. This distinction is maintained in the results table which follows, but the information given in the above paragraph is based on the combined data from the two days.)

The final topic of special interest in the account of the child's leisure-time activities was that of his patterns of play, and the degree of supervision exercised over that play by his mother. This proved to be a much more fruitful 'dimension of difference' than the others, once the fact was recognised that all the children 'played out' most of the time, and that it was subtleties within this framework which mattered.

37 of the mothers insisted that their child 'played out' all the time, not just most of the time. As will be seen shortly, this does not necessarily mean that the child was continuously absent for a number of hours. More commonly, there would be a number of brief dashes in an out, for drinks, or biscuits, or ice-cream money, or perhaps to 'tell tales.' What it did mean was that the child never settled down indoors to play until the compulsory hour of 'calling in.'

The other 26 mothers said their child played in for some part of the evening, but this might have meant anything from watching a favourite children's television programme, to a painting and drawing session. Impossible as it was in the present study to ascertain times precisely, in this case there was no doubt that, out of this 26, not one child spent as much time indoors as out, and certainly for most, the indoor play can have occupied no more than half to three-quarters of an hour.

More interesting differences were revealed by the questions about the mother's supervision of the child's play - where did she let him play, did she always know with whom he played, did she concern herself if he was out continuously for a long spell of time?

The procedure used previously for coding answers to direct questions was employed again here, i.e., all replies to a particular topic were examined, and then classified according to the natural divisions in the data. So, for instance, replying to a question about where their child actually was when he was 'playing out,' women either said that he played in the garden and no further, or that he was

allowed in the street just beyond, or that they had no rules about where he played, and he could go further away if he wished.

Table 10 below gives the information obtained from the account of leisure-time activities - the response categories decided upon for each item, the numbers falling into each category, and their percentage of the whole. Further details are to be found, as before in Appendix 1.

TABLE 10

Information from the account of leisure-time activities (List L)

		N = 63	% (Rough Guide only)	
1.	Play habits:			
	Plays outdoor for larger part of evening	63	100	
	Plays indoors for larger part of evening	0	0	
2.	Time before bed:			
	Interacting with Mother - talking, being read to etc. ...	9	14.3	
	Playing, or straight to bed	22)	34.9)	85.7
	Watching TV	32)	50.8)	
3.	Rainy evening - Mother participation:			
	Even briefly	22	34.9	
	Not at all	41	65.1	
4.	Saturday - leisure time with an adult:			
	Some time spent with adult ...	46	73.0	
	'Plays out' all the time	17	27.0	
5.	Saturday - if go out with adult:			
	Activity is child-centred ...	10	15.9	
	Shopping, visiting	36)	57.1)	84.1
	Not go out with adult	17)	27.0)	
6.	Saturday - Father present and active:			
	Father and child go out together or play together	4	6.3	
	No such interaction with Father ...	59	93.7	

TABLE 10... Continued....

		N = 63	% (Rough Guide only)	
7.	Sunday - leisure time with an adult:			
	Some time spent with adult ...	29	46.0	
	'Plays out' all the time	34	54.0	
8.	Sunday - If go out with adult:			
	Activity is child centred ...	25	39.7	
	Visiting only	4)	6.3)	60.3
	Not go out with adult	34)	54.0)	
9.	Sunday - Father present and active:			
	Father and child go out together or play together	15	23.8	
	No such interaction with father ...	48	76.2	
10.	Weekend evenings:			
	Child centred	6	9.5	
	Out with parents - 'club' or visiting	15)	23.8)	
	TV or playing-in	22)	34.9)	90.4
	Playing out	20)	31.7)	
11.	Some indoor play in the evenings:			
	Plays in some of the time ...	26	41.3	
	Plays out all evening	37	58.7	
12.	Plays where:			
	In garden only	18)	28.6)	71.4
	In immediate vicinity only ...	27)	42.9)	
	Permitted to go further away ...	18	28.6	
13.	Plays with whom:			
	Known to Mother - sibs, alone, or with named friends only ...	36	57.1	
	Unknown to Mother - usually an unspecified group	27	42.9	
14.	Plays out for how long:			
	Child 'pops back' frequently on Mother's encouragement ...	42	66.7	
	Mother unconcerned if child out for long periods at a stretch	21	33.3	

It must be admitted that not as much useful information had been obtained from this exercise as had been hoped. The questions asked were often not the right ones, and with hindsight, it was concluded that really much more descriptive

information is required on how young children actually spend their time before further attempts are made to relate this aspect of their out-of-school lives to their progress in school. Since this latter was the chief concern of the present study, it was decided to spend no more time on topics about which so little was known, and to concentrate in the future stages of the study on the more accessible aspects of the child's environment, such as his mother's child-rearing methods, her interest in his school progress, help with school work, and so on.

Table 9 on page 112 and Table 10 above, together with the demographic data in the earlier tables summarise the descriptive information which was gained from the pilot interviews. It must be stressed that with a sample size of only 63, the percentages given can only be regarded as crude indices, on which no firm reliance can be placed.

While useful for descriptive purposes, the various classifications shown in these tables required further modifications before even the simplest analysis could be considered. The chief reason for this was the smallness of the numbers involved: for example, if it was wanted to compare boys and girls on level of parental aspiration, a five-way classification of the latter would lead to extremely low cell sizes, and possibly even blank cells. In these circumstances, statistical analyses would be particularly prone to the influence of chance effects. When, in addition, the problems of unreliability in category assignment were taken into account - problems likely to be considerable in crude pilot data - it became apparent that some

collapsing of categories would be necessary before statistical analysis could proceed. The problem was how to do this, while preserving the most essential distinctions in the data.

Taking, for example, the item about where children were allowed to play, the procedure adopted was to inspect closely the three existing categories of response, and ask, which of the two extremes did the middle category most closely resemble in spirit? Was the attitude underlying restricting one's child to playing only in the immediate viciinity more like the one permitting play only in the garden, or like the one where the child was free to go where he pleased? Calling on 'common sense' for aid, it was decided that the crucial distinction here was between rules and no rules, so the 'garden only' and 'immediate vicinity' categories were amalgamated.

In other cases, it was decided to make the distinction 'the enthusiastic response' versus 'the rest.' In the case of educational aspirations, for example, the big distinction seemed to be between mothers who were themselves very keen, whether or not they qualified this keenness with reference to the child's wishes, and mothers who 'didn't mind' or worse. Two categories were, therefore, formed from the original five by merging the top two into one, and the bottom three into another. (See Table 9.) The new categories represented 'positive aspirations' versus ' absence of aspirations or indifferent.'

Taking as a final example 'Child reads to mother,' the strategy adopted was again to contrast the enthusiastic or positive response with 'the rest.' Thus, mothers who said

they only heard their child read occasionally - perhaps prompted by the appearance of a reading book from school - were considered not to be showing the same positive attitude as mothers who heard their child read in a regular and purposeful way. Mothers who had been in the habit of regularly listening to reading, but whose offers of help were now being rejected by children who preferred to read on their own, were placed in the same category as continuing regular help-givers. The grounds for this decision were that any other classification, or omission from the sample, would be a distortion, since it would mean selecting out those mothers who had been most effective in the task they had set themselves. It was noted with interest, after this decision had been taken, that Morris in her reading research had encountered the same problem, and had dealt with it in the same way (Morris 1966.) In its final form, therefore, the 'Child reads to mother' variable consisted of two categories, regular help-givers (plus rejected help-givers) versus non-regular help-givers, the latter including occasional help-givers, past help-givers and mothers who had never given help at all.

Some of the questionnaire items had been coded as dichotomies from the beginning: all the others for which meaningful amalgamations could be made are shown in Table 9. Appendix 1 gives full details of the rationale underlying the mergings in each case.

The reading data

It was only when the coding of the interview data had reached the stage just described that reference was

first made to the reading data.

Following the precedent set by the three surveys, which had already used the Southgate test, (Butler 71, Berger and Yule 71, Davie et al 72,) the reading data was left in the form of raw test scores, rather than converted to reading ages, as was intended by the test deviser. These raw scores were obtained by following precisely the marking instructions given in the Test Manual (and described in Appendix 2,) the marking being carried out by the research worker and not by the schools.

The range of scores on the Southgate is 0-30, and Figure 1 below is the histogram of the scores obtained by all the children whom the schools were able to test.

Figure 2a below it is the histogram of the N = 63 children in the final sample. Excluded are children whose mothers were not interviewed, and children whose home circumstances were so 'atypical' as to justify their exclusion from the main analyses. A histogram of these scores is also given. (Figure 2b)

A comparison clearly had to be made between the reading attainments of these various subgroups of children. With many similar comparisons to follow, the question as to how best to do this required thought primarily because of the shape of the reading score distribution. Bunching at the top end of the reading scale was found in some subgroups but not in others: in such cases, the usual comparison of means would under-estimate group differences. This method was used, however, in very similar circumstances, by Butler on her Isle of Wight sample (Butler 71) and by Berger and Yule in Camberwell (1971).

Figure 1. Histogram of Southgate raw scores (N = 79)

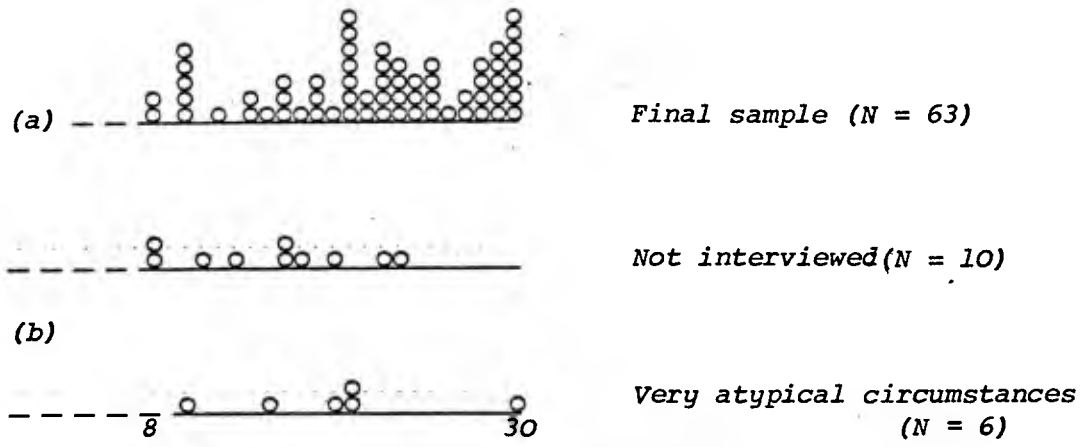


Figure 2. Southgate raw scores of final sample (N = 63) and of children excluded from final sample

In the National Child Development Study, on the other hand (Davie et al 72,) the method was adopted of grouping the continuous reading data into 'poor,' 'medium' and 'good' readers (according to arbitrary cut-off criteria,) and then using χ^2 techniques to compare subgroups on the proportions of their number which fell into these categories. (Butler used this method also.)

Considering the size of the ceiling effect in the present study, the grouping technique seemed the best one to adopt as an initial measure. Analyses below which deviate from this model will be explained further.

Returning then to the histograms above, these may be converted using one of the NCDS systems, to the following contingency tables.

TABLE 11

Grouped Southgate score: comparison of original and final samples

	Southgate Score			
	'Poor' 0 - 15	'Medium' 16 - 27	'Good' 28 - 30	
Total reading sample	17	45	17	79
Not interviewed plus very atypical circumstances	6	9	1	16
Final sample	11	36	16	63

On the 2 x 3 table, $\chi^2 = 4.55$ with 2 d.f., which is not significant at the 0.05 level.

Although analysis of the contingency table revealed a non-significant difference, inspection of the histograms suggests that a small bias was introduced by the loss of 16 children from the overall sample. 15 of these children came from the 'poor' and 'medium' reading groups, and only one from the 'good' readers, whereas the original sample had children in these groups in the proportion of about four to one.

The range of scores in the final sample was, however, the same as in the original, i.e. low scorers were included, but not in their true numbers. The reasons for the low scores in most of the excluded group can only be a matter for conjecture - unstable home circumstances leading to emotional disturbance and maladjustment being an obvious possibility.

Whatever the reaons, the final sample may well have been selected for 'normality' to a certain extent. Conclusions applicable to such a sample can not necessarily be generalised to children exposed to more extreme stresses, and this must be borne in mind when interpreting the results of the present study.

Before moving on to a more detailed treatment of the reading data, one point must be made which might otherwise not be appreciated. This is, that at seven years of age, after attending the same schools and living in the same sort of area, this group of children was already exhibiting a wide range of reading proficiency. From the worst to the best readers, the span was at least 18 months of reading age.

Increasing understanding of why this should be so was the aim of the detailed analyses described in the section to follow.

Comparison of the Southgate scores in the present study with those from a national sample

The total sample in the present study for which reading data was available was used in this comparison, i.e., N = 79.

In the NCDS, all the sample children had been born in the same week in March 1958. Their reading was tested in the final stages of their infant schooling, as it was in the present study. In the latter, the children ranged in age from 6 : 11 to 7 : 10 when tested, the mean being 7 : 03. Fortuitiously, this was the mean age on testing of the NCDS children also. (A spread of ages was exhibited in the NCDS sample, because it had not been possible to test all the children at exactly the same time.) On this basis, it was considered meaningful to perform a rough comparison of the reading standards in the two samples, as show in the table below.

TABLE 12

Grouped Southgate score:
comparison of the NCDS and Dagenham samples

Southgate scores	NCDS	Dagenham
0 - 20	28.6%	49.4%
21 - 28	39.3%	34.2%
29 - 30	32.1%	16.4%
N	15,496	79

(It will be noted that the cutpoints dividing the Southgate distribution in the above table differ from those used in Table 11 on page 126. Table 11 follows the system used extensively in the first NCDS report (Pringle et al 66.) Table 12 follows the different system adopted - but little used - in the second NCDS report (Davie et al 72,) because it is only in the second report that the full sample figures are made available, the first report being based on 'early returns.')

It is clear from the table that the reading standard of the present sample of children is well below the national average. The national sample of course included children from all social classes, whereas the present study sample was almost entirely working class. In the second NCDS report, Table 165A gives a breakdown of Southgate scores by social class. If only the children whose fathers have manual occupations are considered the summary table below is produced.

TABLE 13

Grouped Southgate scores:
comparison of the NCDS subsample with present study

Southgate scores	NCDS subsample	Present study
0 - 20	33.8%	49.4%
21 - 28	39.5%	34.2%
29 - 30	26.7%	16.4%
N	9528	79

As may be seen, the Dagenham children still lag behind.

Other comparisons

Two other surveys have used the Southgate test on children in their final term of infants' school. Butler (1971) studied children on the Isle of Wight, which is a relatively prosperous, semi-rural area, with some small towns, while Berger and Yule (1971) worked in the "socially deprived urban setting" of a south-London Borough. For some reason, Butler's sample, despite being tested in the summer term the same as the others, had a much lower mean age - 6 : 08 compared to the NCDS and the present study's 7 : 03. Berger and Yule do not give a mean-age figure.

Since Southgate raw scores are, by design, correlated with age, a proper between-group comparison could only be made if age differences were taken into account. The necessary data were not, however, available to do this, so Table 14 below must be regarded as providing no more than contextual information for the present enquiry.

TABLE 14

Grouped Southgate scores:
comparison of Isle of Wight, Camberwell and Dagenham samples

	Southgate scores			
	N	Mean	S.D.	
Isle of Wight	410	19.2	7.6	(Mean age 6 : 08)
Camberwell (total sample)	2369	18.9	8.4	
Camberwell (U.K.born parents)	1305	20.0	8.3	
Dagenham	63	21.6	6.4	(Mean age 7 : 03)

Perhaps the most which can be said is that the previously established inferiority of reading standards in Dagenham seems less certain when the comparison is with an Inner London area rather than with a national sample.

Before moving on to the more complex analyses of the reading and interview data, a further word must be said about the relationship between Southgate raw score and age.

Appreciating that a product-moment correlation performed on a curtailed distribution (i.e., one showing a ceiling effect) would be an inexact estimate of the existing degree of association, the calculation was performed, and revealed a correlation of age with Southgate raw score of 0.40. Since age is unlikely to bear more than a chance association with any of the other predictor variables in the study, subgroup comparisons such as those involving social class, or aspirations, or anything else, are unlikely to be invalidated or contaminated by this effect. It is chiefly of importance in drawing attention to the fact that age differences within any subgroup, however tightly that group is defined on other measures, will be associated with a spread of reading scores within that group. This should be borne in mind when reading the account to follow.

Analysis of the Reading and Interview Data

The data under immediate consideration were obtained in a pilot study. The questions asked had been exploratory, with coding of responses being flexible and somewhat unrefined. The final sample size was very modest. Nonetheless, the interviews had yielded a large amount of information, which it was now necessary to relate to pupil performance. The task was to do this in the most meaningful way, educationally speaking, while at the same time remembering the limitations of small sample size, and the nature of the data.

The temptation existed to cross-tabulate everything in sight, but it was decided that the easiest way of 'keeping to the path' was to recap on the original questions asked, and to tailor the analyses very closely to answering these and these only.

Reference is made at this point to pages 31-33 and 62-64 of the present report: in the earlier section, the aims of the present study were outlined, while in the later section, the questions to be asked were spelt out in more detail, with particular reference being made to analysis using multiple regression techniques. These techniques were not used on the pilot data, however, on the grounds that they were too sophisticated for an exploratory study. It was decided to limit analysis of the pilot data to simple cross-tabulations and group comparisons involving no more than two-way classifications. Bearing this limitation in mind, the pilot data could be used to answer the following questions :

1. Looking first at the relationships between reading score and the suggested 'predictor' variables taken singly, (reference here is to Question 1 on page 62 .)

   (i) Do demographic variables retain their predictive power over school achievement when applied to a homogenous working class population?

   (ii) Can behavioural and attitudinal characteristics of the family be identified which also act as predictors of reading attainment? (Some of these variables have been previously studied in this context, others have not.)

2. Moving on to examine the inter-relationships amongst predictors, (reference is to Question 2 on page 63 .)

   (i) Are the different demographic groups characterised by different patterns of behaviour and attitudes?

   (ii) Is the effect of a particular demographic characteristic on attainment mediated in part by behavioural or attitudinal characteristics, or are the two virtually independent? (See Section 2 (a) on page 63 .)

   (iii) Do the different behavioural variables overlap, and if so, do all make unique contributions to the determination of attainment, or do some just 'borrow' their effect by association with other variables? (See Section 2 (b) on page 63 .)

Recalling the terminology of earlier sections of this report (see page 43), Question 1 (i) above refers only to the power of 'frame' (Husen 72) or 'distal' (Gagne 70) variables in the prediction of achievement, Question 2 (iii) looks at the inter-relationships amongst 'process' or 'proximal' variables, and all other questions look at the relationships between frame and process (distal and proximal) variables.

It must be recognised from the beginning - as has indeed been stated in an earlier beginning that this - that answers to the above questions can never really be phrased in terms of causality, even when the association between only two variables is being considered. When discussion proceeds to the inter-relationship of distal and proximal variables, an appeal can only be made to plausibility. A mother's child-rearing practices are unlikely to influence her social class, whereas her social class, by a complex network of mechanisms, is quite likely to influence her approach to the upbringing of children.

What can never be said, of course, is that all of the influence of a distal variable, such as social class, is mediated via any number of named proximal variables, such as child-rearing methods. What can be said, however, again appealing to plausibility, is that the distal variables studied here are unlikely to exert any appreciable direct effect on the criterion variable in question. The occupation of a child's father, or the size of the family to which he belongs, must exert their influence on his school attainment via a constellation of intervening mechanisms. Plausible direct mechanisms are hard to imagine. In these

circumstances, if proximal variables are found which are less powerful predictors than the distal ones, the possibility exists that they are not the chief mediators of the distal effect. Quite other variables may fulfil this role, and the assumed proximal variables may do no more than co-occur with the distal ones, without themselves playing any part in the determination of attainment.

The problem would be complex enough with just one variable of each type, as in Douglas' classic analysis of the influence of parental attitudes on school achievement being mediated almost entirely by their influence on the attitudes of the child. (Douglas 64.)

In the present study, there are a number of both distal and proximal variables to be considered. At both levels, a substantial inter-relationship of variables is to be expected. In a national sample, an association has been found between social class and family size, for example. (Davie et al 72.) At the level of proximal variables, a priori hypotheses can be made about their tendency to 'go together.' Mothers whose approach to discipline is to coax and cajole might be expected to talk more to their children in other situations also, i.e., they may be prepared to 'chat' to their child on occasions, rather than always discouraging such interaction. The task is one of disentanglement, and may be broken down, in practical terms, as follows :

1. Look first at the distal variables and see if any effect on attainment exists to be explained. Look at social class, family size, mother working and family circumstances. Look also at the sex

variable - does it have any effect?

2. Look at the proximal variables. First look at their distributions - do members of a working class population vary along the dimension in question? Second, do the proximal variables have any effect on reading attainment - i.e., have any of the right questions been asked at all?
3. Look at the inter-relationships of the predictor variables, both proximal and distal. Do groups defined on demographic (distal) measures exhibit different patterns of behaviour and attitudes (proximal measures); and do certain behaviours and attitudes tend to occur together? As described above, certain patterns of association are expected. Mothers who have 'child-centred' attitudes to bringing up children, as assessed by one criterion, will tend to have a similar approach as assessed by another. So, for example, considering mother's language behaviour and her preferred disciplinary method, if each variable is coded simply as favourable/unfavourable, and a standard contingency table is constructed, then large numbers of cases are expected in the cell indicating two favourable practices, and also in the cell indicating two unfavourable practices. Smaller numbers of cases are expected in the other two cells, (the "off-diagonals").

This type of arrangement has the appeal of simplicity, but two important drawbacks. Firstly, the sample size in the pilot study was not large enough for anything more than a

two-way classification, and preferably then with both variables coded as dichotomies only. Even in these circumstances, if the association between the two variables was very strong, the 'off-diagonal' cell sizes might fall so low as to be easily distorted by chance effects. (Carrying out statistical tests of the χ^2 type is not advisable if some cell sizes have fallen below a certain level. Another test, the Fisher Exact, could be used in these circumstances, but it is not available in computer program packages (see page141) and would be very lengthy to compute by hand on a sample of 63 - see Siegal 1956. Analyses performed using this test would also still be subject to the criticism described below.)

The second, and more important drawback to relying on simple classifications is that the number of possible two-way cross-tabulations is very large. If statistical tests are to be employed which evaluate the form of the data in terms of its probability of occurring due to chance, then a series of such tests must be treated with great caution. A large number of comparisons, some of which are 'significant at the 5% level' will inevitably contain some false positives, i.e., some comparisons will yield apparently significant results, which have, in fact, been produced by nothing more than the effect of chance factors.

Considering the exploratory nature of the present study, together with the problems mentioned above, it was decided to limit the number of cross-tabulations performed to those directly relevant to answering the questions already asked, and to place very limited reliance on the outcome of statistical tests.

The opposite of a false positive in this context is a false negative, or Type 2 error, i.e., accepting the hypothesis of no association when it is in fact false. In an exploratory study, using crude measures, it is erring on the side of caution to increase the strictness of criteria for accepting a result as positive and to accept that, in the process, a number of real effects will be missed. It can then remain for future, more sensitive, investigations of particular factors to check on the 'negative' results.

4. The problem of investigating the inter-relationship of proximal and distal variables is magnified when the dimension of their effect on reading is introduced. Small cell sizes in a two by two cross-tabulation now become small cell sizes in a 2 x 2 analysis of variance design. Peaker (1967) discussed this problem at length in his introduction to the analysis of the Plowden Survey data. His main point was that a simple comparison of attainment scores from groups classified on only one dimension can be very misleading. The dimension of classification may bear no relationship at all to attainment, but if the groups so formed contain unequal numbers of children from categories known to show different levels of achievement, then a quite spurious group difference may be observed. (For example, if the performance of children from state and voluntary-aided schools was being compared, quite spurious results could be obtained if the social class composition of the schools' intake was not taken into account.)

The answer is multiple classification, but then the problems return of small cell sizes, and an infinity of possible classifications.

Peaker's solution was to recommend and adopt the statistical procedure of multiple regression analysis, in order to disentangle the unique and common contributions of a large number of predictors. As was stated in an earlier section of this report, when the design of the present study was being discussed, multiple regression was chosen as the main analytical technique to be employed on the study data. It was rejected, however, as a method of analysis for the pilot as being too sophisticated for an exploratory study which sought to find out which variables, out of a number, had any effect at all, rather than attempt to establish the relative power of different predictors.

It was decided to limit analysis of the pilot data to simple comparisons, with at most, two-way classifications, but to choose carefully which comparisons to carry out and, as before, to treat statistical significance with caution.

It is worth pointing out here that Peaker's criticisms of one-way comparisons apply equally strongly to the sort of comparison that it is common practice to perform - social class, family size comparisons, for example. In these cases, it may, however, be argued that it is not misleading to make simple comparisons, because the categorizing variables are in no danger of being mistaken for causes per se.

As a result of all the above considerations, it was planned to place most reliance when examining the pilot data on visual inspection of histograms and scatterplots, and, to a lesser extent, on χ^2 analyses of cross-tabulation tables.

It was planned to carry out selected parametric analyses also, but to view any findings as corroborative rather than central to any argument, because of probable violations of some of the more restrictive parametric assumptions underlying the use of the tests: homogeneity of variance assumptions would be an example here.

Because quite a large number of comparisons were to be performed, it was again decided that a conservative strategy should be adopted when assessing the significance of group differences. As before, it was recognised that, although doing this would reduce the likelihood of picking up chance effects (or 'type 1 errors',) it would necessarily increase the likelihood of missing real effects (false negatives or 'type 2 errors'.)

One final point remains to be made about multiple classification procedures, when the classifying variables are highly inter-correlated. In a two-way analysis of variance arrangement corresponding to the two-way cross-tabulations described in detail above, there would only be a small number of cases in the 'off-diagonal' cells. These cases are the ones where the two classifying variables have been 'separated out,' i.e., such a case would only have a 'favourable' coding on one variable, not both. The point of intrest is that, in some circumstances, these cases may themselves be 'atypical' in the sense that certain characteristics do tend to go together, and it will be an unusual mother who scores on one but not on the other. What it is about her, her history, or her current circumstances, which has led to such an unusual

pattern of upbringing methods can only be guessed at. Further, the effect of any 'atypicality' on the criterion variable of school achievement remains an unknown quantity.

Numerical analysis of the pilot data was carried out using an IBM 360 computer, and commercially available package programs, designed to handle social survey (i.e., non-orthogonal) data. The programs used were either sub-routines in the well-known SPSS package (Statistical Package for the Social Sciences) or programs from the various BMD series ('Biomedical' series.) The computer cards were punched, then verified twice by hand, before being used in any analysis. Only the 63 cases from the final sample were punched, so all analyses that follow are based on that figure.

Demographic variables and reading achievement

Social Class

A stratified histogram of reading scores was plotted, the stratifications being the three coded levels of social class. Adopting the first (see page 129) NCDS system of grouping Southgate scores, scores 0-15, 16-27 and 28-30 were grouped together, and labelled 'poor,' 'medium' and 'good' readers, respectively. A cross-tabulation table was constructed of the numbers of children in each of these categories, for each social class group. The three by three table produced, when inspected together with the histogram (Figure 3) suggested that the better readers were more likely to come from the higher social groups.

TABLE 15

Grouped Southgate Score by social class (1)

		Reading score			
		0-15	16-27	28-30	
Social class	IIINM	1	7	6	14
	III M	2	11	8	21
	IV & V	8	18	2	28
		11	36	16	

A χ^2 test, carried out on the table yielded a value of 10.74 for χ^2, which, with four degrees of freedom, corresponded to a probability of the array occurring due to chance of .03. It was recognised that, owing to small cell sizes, some of the assumptions underlying the χ^2 test had not been met in full. However, since the results were only being regarded as suggestive, rather than in any sense conclusive, this was accepted for the pilot analysis. Combining poor and medium readers into one group, as is done on occasions in the NCDS reports, produces a table which meets χ^2 requirements, in that fewer than 20% of the cells have an expected frequency of less than 5. (Siegal 1956.)

TABLE 16

Grouped Southgate Score by social class (2)

		Reading Score		
		0-27	28-30	
Social Class	IIINM	8	6	14
	III M	13	8	21
	IV & V	26	2	28
		47	16	

The value of χ^2 obtained for this table is 8.95. With 2 d.f., this value is significant at the .01 level, on a one-tailed test. It was concluded from these figures that, even within a very homogenous area such as Dagenham, a social class gradient in achievement may still be observed.

Small cell size may of course be of interest in itself, whatever the problems it creates for statistical testing. Out of 28 children classified as belonging to social classes IV or V, i.e., with fathers in semi- or unskilled occupations, only 2, or about 7%, belonged to the group of 'good' readers, as defined by a Southgate score in the range 28-30.

Looking again at the breakdown of the NCDS Southgate data by social class, about 23% of their 'semi- and unskilled' children could be classified as good readers on the stricter definition of having a Southgate score in the range 29-30. (Davie et al 72.) On this criterion, only one child out of the 28 'semi- or unskilled' children in the present sample could be classified as a good reader.

Overall, 32% of the national sample fell into the 29-30 group, whereas only 19% (12 out of 63) of the present sample did. Most of this discrepancy is accounted for by the poor scores of the semi- and unskilled group. Children in the present sample from this sort of home do far worse than might be expected on the basis of the NCDS data. The result for the 'skilled manual' group is much more in accord with the national sample figures: in the NCDS, about 29% of 'skilled manual' children scored 29-30 on the Southgate; in the present study, 33% (7 out of 21) did. It was concluded that the NCDS finding of very little fall-off in the proportion of good readers from the higher

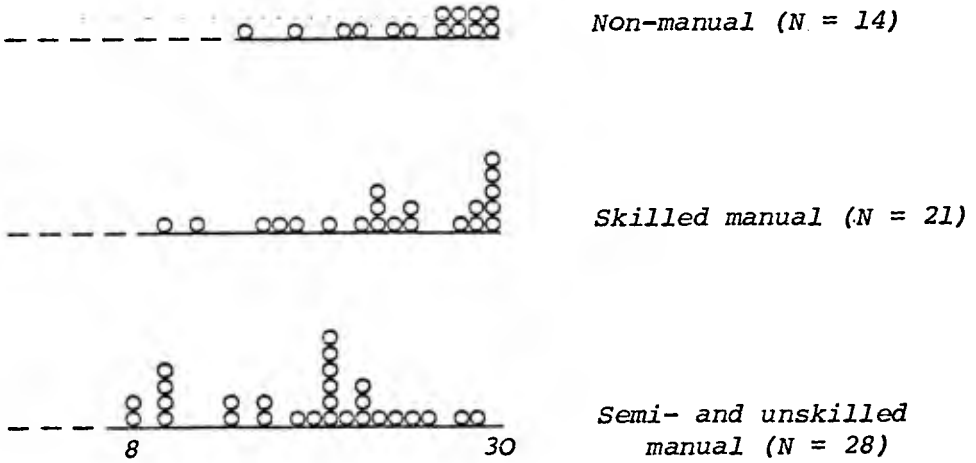


Figure 3. Southgate score by social class

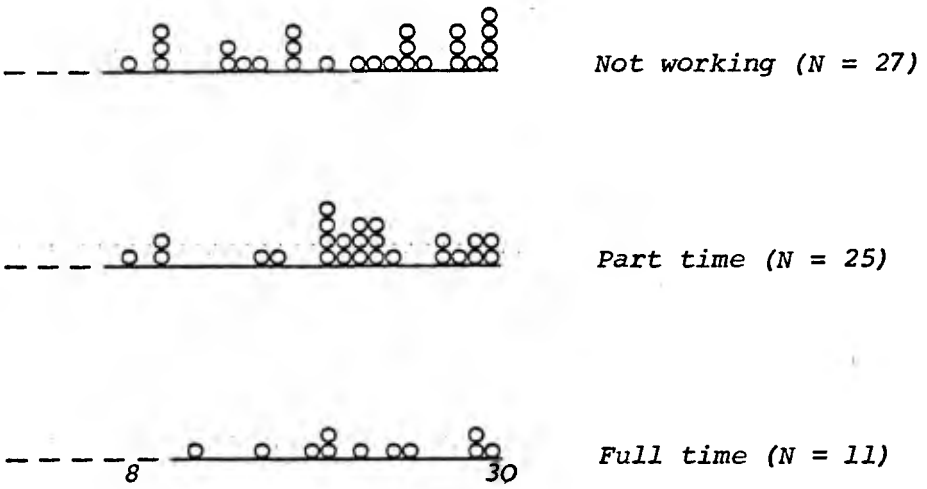


Figure 4. Southgate score by mother working

to the lower grades of 'manual working class' was not replicated in the present study sample.

Comparison of the non-manual group in the present study with a national figure cannot be made, because of the atypical make up of this group in Dagenham - i.e., with a very small proportion of true white-collar workers, and a relatively large proportion of occupations more closely allied to manual work - salesmen, proprietors of small engineering businesses, and so on.

Mother working

The procedure adopted for examining this variable, and the others which follow, was exactly as described above for social class. There were three levels for 'mother working' - not working, working part-time, nad working full-time. The stratified histogram of reading score by these sub-groups appears in Figure 4, while the cross-tabulation is shown in the table below.

TABLE 17

Grouped Southgate Score by mother working

	Reading Score			
	0-15	16-27	28-30	
Not working	7	12	8	27
Part time	3	17	5	25
Full time	1	7	3	11
	11	36	16	

The value of χ^2 for this table was 3.83: with 4 df,

this array could occur by chance with a probability of .43, i.e., the result is 'not significant.'

Full consideration of the implications of findings such as this one must wait until a later chapter. Suffice it to say at present that controversy exists over the effects of a mother going out to work. The NCDS addressed itself to this problem also, asking questions not only about the mother's present activities, as was done here, but also about her employment, if any, before her 7-year old began school. Their results show that, after allowing for social class and family size, there is a slight association between mothers working before children start school, and reading ability at the age of seven, equivalent to a loss in reading age of about three months for the children of full-time working mothers. If only mothers working after their children begin school are considered, this difference is approximately halved. For comparison, in the same terms, moving from social classes I and II to social class V is equivalent to a loss in reading age of 22 months, according to the NCDS findings.

Family size

The overall number of children in the family to which a particular child belongs is the simplest metric obtainable. More detailed information which may be of importance includes the child's birth order (i.e., the number of sibs he has who are older than himself) and the number of younger sibs in the family.

The NCDS found an overall effect of family size on school achievement, which could be broken down into unique

contributions of both birth order, and the number of younger sibs. Disentanglement of separate contributions, which the NCDS was able to achieve with its very large sample, had not been foreseen as possible in the present study. In fact, the problem did not arise, because no significant differences in reading ability were found on any family size index. On the grounds that plotting everything is permissible in a pilot study, histograms were drawn up of reading scores stratified by:

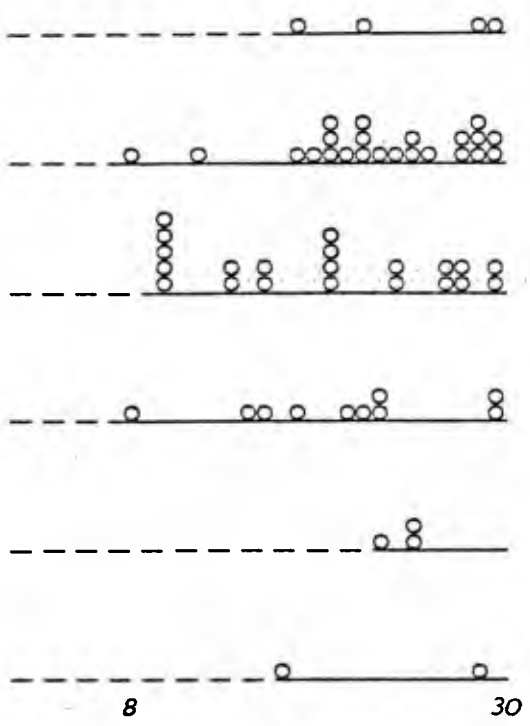
total family size; number elder sibs; number younger sibs; eldest/youngest/only/ other.

The last mentioned system was that used by Rutter et al (1970) on the Isle of Wight, as an attempt at disentangling the influences of family size and ordinal position.

All these histograms, and the cross-tabulation tables that go with them, are presented in Figures 5-8, below. A series of χ^2 tests revealed no association of family size or birth order with reading attainment in the present sample. Consequently, no further attempts were made at unravelling the complex of factors involved.

These negative findings are, of course, contrary to established opinion. It may be that the effects in question are not strong enough to show up in a small sample such as this; but if so, that is of interest in itself, since social class differences were still strong enough to be observed. On the other hand, it may be that family size is genuinely not a useful index of home circumstances in a working class sample living in a materially adequate environment.

Figures 5-8. Grouping of Southgate scores for all crosstabulations: Poor (P) 0-15, Medium (M) 16-27 and Good (G) 28-30.

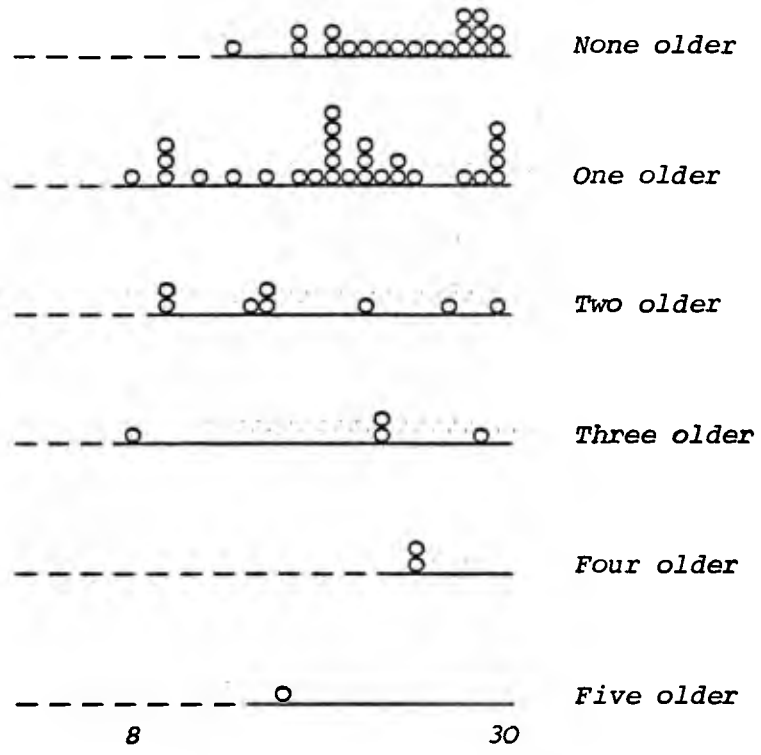


Cross-tabulation

	P	M	G	
1 + 2	2	16	9	27
3	7	10	4	21
4 + 5 + 6	2	10	3	15
	11	36	16	63

$\chi^2 = 6.36$ with 4 df.
Not significant.

Figure 5. Southgate score by number children in family.

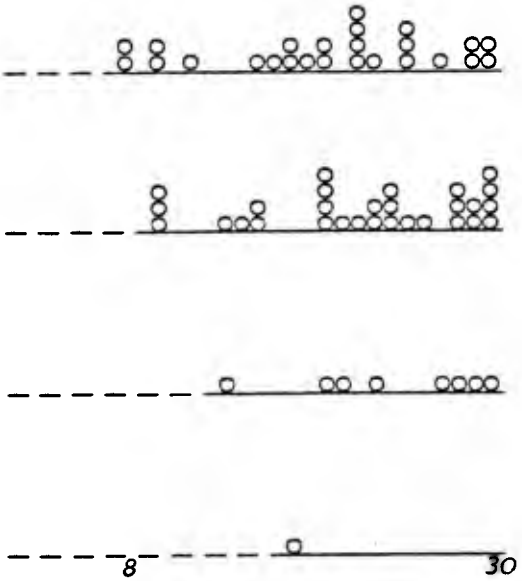


Cross-tabulation

	P	M	G	
None	1	11	8	20
One	6	16	6	28
Two+	4	9	2	15
	11	36	16	63

$\chi^2 = 5.42$ with 4 df.
Not significant.

Figure 6. Southgate score by number older sibs.

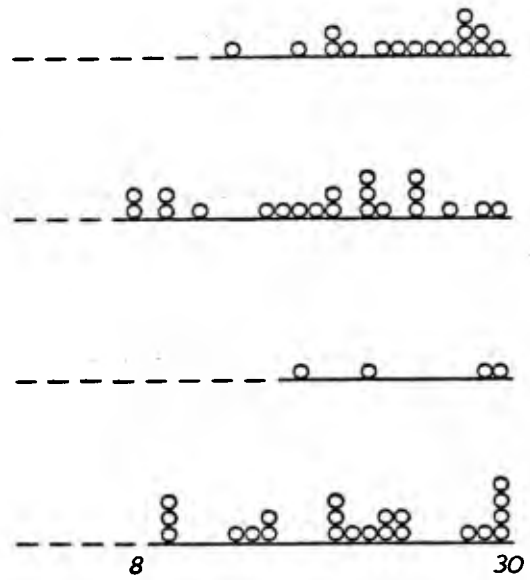


Cross-tabulation

	P	M	G	
None	5	16	4	25
One	5	15	9	29
Two+	1	5	3	9
	11	36	16	63

$\chi^2 = 2.08$ with 4 df.
Not significant.

Figure 7. Southgate score by number younger sibs.



Cross-tabulation

	P	M	G	
Eldest	1	9	6	16
Youngest	5	14	2	21
Other	5	11	6	22
	11	34	14	59

(omitting 'only' children)

$\chi^2 = 5.49$ with 4 df.
Not significant.

Figure 8. Southgate score by eldest/youngest/only/other.

Family Circumstances

It will be recalled that before analysis began, six children were eliminated from the sample because their family circumstances were so unusual as to make complete data collection on them impossible. These six cases were returned to the sample for this comparison only, raising N to 69. The stratified histogram of reading scores for this variable is given in Figure 9, below. The number of 'atypical' children is too small to merit any analysis beyond inspection of the histogram. This latter procedure in turn provides only negative evidence, i.e., there is no sign of any clustering of the 'atypical' children towards either end of the scale.

This finding is compatible with that of the NCDS, which found that a 'broken home' is associated with poor reading attainment in middle class or skilled manual families, but not in social classes IV or V. Reasons for this difference are not known. The subject will be returned to at the end of this chapter.

Two other characteristics of the child rather than his family remain to be considered: sex, and the school attended.

Sex differences

A sex difference in primary school attainment levels has been demonstrated on numerous occasions, not least by the NCDS, the Isle of Wight study, and the National Survey (Douglas 1964.) As Douglas put it:

> "In reading, writing, English and spelling, the average 11-year old girl beats the average 11-year old boy."

For some unknown reason, the present sample contained a disproportionately high number of girls - 43, as against only 20 boys. This was not caused by loss from the sample being biassed in favour of boys since the original combined roll of 82 children was comprised of 56 girls and only 23 boys.

The stratified histogram of reading score by sex is presented in Fig 10 below, together with the appropriate crosstabulation table. A χ^2 test revealed no significant difference in the reading score of boys and girls, and inspection of the histogram lent further weight to this belief. Why this should be the case is not clear. Discussion of possible reasons is taken up at a later stage in this account.

School effects

The stratified histogram of reading score by school is given in Figure 11.

A χ^2 test on the grouped reading data by school revealed no significant difference. Inspection of the histogram did suggest a slight superiority for School L, however, so a t-test was performed on the group means as a further check. The results are given below.

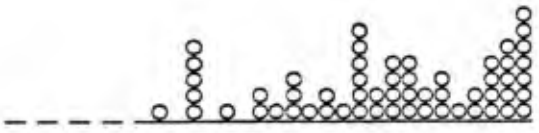
TABLE 18

Comparison of two sample schools on mean Southgate score

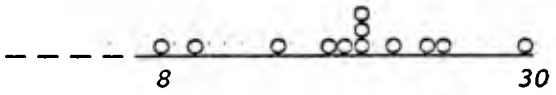
	N	Mean	S.D.
School L	31	23.55	5.21
School E	32	19.75	6.98

t = 2.42 with 61 df. $p<0.02$ for a two-tailed test

Figures 9-11. Grouping of Southgate scores for all crosstabulations: Poor (P) 0-15, Medium (M) 16-27, Good (G) 28-30.

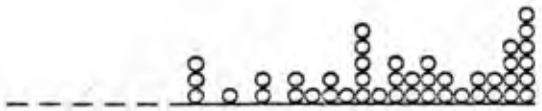


'Typical' (N = 57)

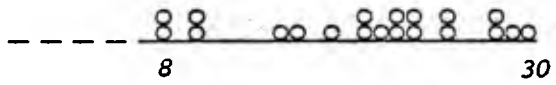


'Atypical' (N = 6 + 6)

Figure 9. Southgate score by family circumstances.



Girls



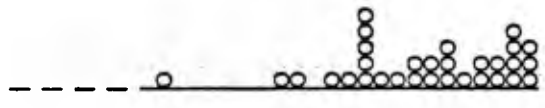
Boys

Cross-tabulation

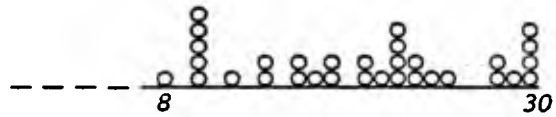
P	M	G	
6	25	12	43
5	11	4	20
11	36	16	63

$\chi^2 = 1.31$ with 2 df. Not significant.

Figure 10. Southgate score by sex.



School L



School E

Cross-tabulation

P	M	G	
2	20	9	31
9	16	7	32
11	36	16	63

$\chi^2 = 5.13$ with 2 df. Not significant.

Figure 11. Southgate score by school attended.

From this finding, together with the evidence of the histogram, it was concluded that School L did have rather better reading standards than those in School E. In particular, the schools differed in the proportion of their children classified as 'poor' readers, School E having the larger proportion of such children.

Interpretation of this finding was postponed until more was known about the homes from which School L and School E children came.

The effects of parental attitudes and behaviour on reading achievement

The coding of these home variables and the distribution in the sample of the categories so formed was described in an earlier section. As was pointed out then, some variables were excluded from further analysis at that stage, because they were not tapping dimensions of difference within this working class population. Tables 9 and 10 gave the full category codings of all the variables retained, and also the dichotomous codings produced after collapsing cells for the purposes of analysis.

Altogther, there were 30 variables retained at this stage, and coded for analysis. The tasks now were to determine the extent of the inter-relationships of selected combinations of these variables, and the degree of association with reading ability of the subgroup classifications so formed. These two sets of investigations were carried out in parallel, and the results obtained will be presented in a similar manner.

Preliminary examination of data

The hazards of performing a long series of χ^2 tests of statistical significance were always well recognised. On the other hand, it was seen as one of the functions of a pilot study to throw up ideas, sift them, and subject the most promising to testing on new data. The sifting process was considered to be essential, as not all questions originally conceived were found to be appropriate to the sample being studied. For example, on the question of the role of the father in the upbringing of his children, the original hypothesis had been that the amount and nature of the interaction between father and child would be related to the school achievement of that child. Implicit in this suggestion is a middle class model of father-child interaction, which encompasses a spread of different types of activity, from sitting together with toys or a book, to active outdoor games. In the present study, however, despite probes during interviewing, the overall level of father participation was revealed to be very low in terms of time spent, and very limited in terms of the types of activities involved. The most intense forms of interaction seemed to be 'going over the field together to see the horses,' or playing organised games like football. Much of the rest was pure rough and tumble, indoors or out - "He torments 'em, you know."

Any hypothesis about the effect of father participation must be a very weak one indeed if the most extreme comparison which can be made is between fathers who play football on Sunday afternoons, or 'go over the field' with their children, as opposed to fathers who do nothing at all.

Admittedly, this is caricaturing the situation to a certain extent, but the point which is being made is a valid one. Very little is known about styles of father-child interaction in different social groups, and nothing about the effects on the children in school of differences in these styles. What the present study suggests is that applying a middle class model to working class families is particularly inappropriate in this field. Much more descriptive information about working class practices is first needed, in order to establish the dimensions of difference which actually exist, before any further attempt is made to seek effects of such differences on children.

For reasons such as this, a decision was made to exclude from further analysis those items in the list of 30 which were obviously inappropriate or ambiguous when applied to the sample being studied.

Altogether, six items were eliminated from the list of 30 on the grounds that they were unsatisfactory in some way. Four of these concerned the role of the father in the upbringing of the child. It was decided, firstly, that the information about a father's activities which could be obtained by interviewing his wife was very limited and probably inaccurate; and secondly, that the present study had simply not asked sufficiently pertinent questions. The situation, therefore, was one of expecting to find no significant differences in the reading scores of children from the various subgroups which were actually found as opposed to those which had been expected. After this decision had been taken about the value of the data obtained on the

father's role, it was decided that these 'null hypotheses' should be tested, if only for the sake of completeness. A series of t-tests were, therefore, performed, and yielded the expected, i.e., non-significant, results.

The fifth item to be excluded as unsatisfactory was L1 (see Table 10). This item concerned the child's play habits, and was excluded as useless for present purposes, because all respondents gave the same answer (i.e., that their children 'played out' for the greater part of each evening.)

The sixth item which was excluded at this stage was L11, which contrasted those children who played out all evening with those who played indoors at least some of the time. Apart from being a very mixed bag in the sense that the time spent indoors varied from ten minutes up to an hour, it also became apparent during the interviewing that children who played indoors were largely doing so against the wishes of their mothers, rather than as a result of them. Mothers were sometimes scornful of their 'babyish' child, and clearly felt it necessary to find reasons for his lingering indoors, reasons which included bullying, lack of the necessary toys, "it's when the others get on them bikes. He hasn't got one, yer see...," or a perceived excessive attachment to themselves, "it's since I went into hospital to have the other one - she never goes far from me these days."

On the whole, then it appeared that in a context of almost universal 'playing out,' children who spent some of their evening indoors did so for a variety of reasons, many of which were quite unrelated to the mother's child-rearing

practices, or indeed to her preferences and ideas of how a child should spend his time. The item was, therefore, excluded from further analysis because of its unexpected ambiguity. (Again, for completeness, a t-test comparison was performed, and again, a non-significant answer was produced.)

The 24 items remaining were subjected to further scrutiny before a final list of satisfactory variables was produced. The nature of this scrutiny was that recommended by Maxwell (1961) in his book on analysing qualitative data.

Maxwell's first recommendation is to eliminate any item which does not discriminate sufficiently well amongst the respondents. As a result of his variance calculations, he advises elimination from the list of items "those to which more than 80% or less than 20% of respondents give favourable answers." For a sample of 63, these figures correspond to cut-offs of 12 and 51. The item list was, therefore, scanned for cell sizes less than 12, or greater than 51, and five items were excluded for not meeting this discrimination criterion. These were :

D1. TV programmes watched. Only 8 children had their TV viewing regulated by their mothers in terms of what they were allowed to watch.

D6. Father's present reading. Only 10 fathers were reported as being keen and regular readers of books.

L2. Time spent by the child between coming indoors, or supper, and going to bed. Only 9 children were reported as spending this period in direct

interaction with their mothers, such as talking to her, or listening to her read or tell a story.

L5. Saturday outing which is child-centred. Only 10 children were said to be taken on this sort of outing on a Saturday.

L10. Weekend evenings. Only 6 children usually spent either Saturday or Sunday evening in child-centred activities with their parents.

Nineteen items remained after this somewhat strict sifting process. This reduction before analysis was considered to be preferable to letting the statistics do the sifting, by rejecting the same ill-thought-out-hypotheses, but in an apparently more scientific way. In a pilot study, whether or not the actual statistical comparisons are made is of less importance than making realistic adjustments to hypotheses in the light of the data obtained.

Returning then to the nineteem items left, these are listed briefly in the table below.

For the purposes of analysis, a limited number of items (* in the table) were selected from this list as justifying direct comparison with reading scores. Questions 6, 9 and 10 were selected as the embodiments of established theory. Questions 11 and 12 were picked out as being particularly relevant to reading ability as opposed to general school progress.

The remainder of the items in the list, 14 of them, were not treated individually, but rather as though they were all items on an inventory, or check-list, of middle class characteristics of child-rearing.

TABLE 19

Non-demographic items which discriminated amongst sample members

1. Amount of TV watched
2 Usefulness of TV to mother
3 Interest in school news
4. Mother's response to good news from school
5. Disciplinary method
* 6. Mother's willingness to chat
7. Familiarity with teachers
8. Familiarity with school work
* 9. Aspirations
*10. Mother's present reading
*11. Mother reads to child
*12. Child reads to mother
13. Child plays where
14. Child plays with whom
15. Child plays out for how long continuously
16. Rainy evening - mother participation
17. Saturday - time spent with adults
18. Sunday - time spent with adults
19. Sunday - child-centred outing.

If such a list is to be a real inventory, it is necessary to make the assumption that all the various items are tapping different aspects of one underlying general dimension; in this case, a more or less 'middle class' style of upbringing.

The next step in this line of reasoning is to obtain an assessment of the level of the general factor by totalling the number of inventory items which were answered favourably.

This model was adopted as being both applicable and useful in the present case, but once again, reference was made to Maxwell (1961) for advice as to how to proceed.

According to this source, a further check must be made at this stage on the items in the inventory. What is required is to check that the response to each item increases as the total inventory score increases. To do this, cases are first arranged in order of total score, then divided into a number of subgroups. The proportion of respondents in each subgroup who give 'favourable' responses is calculated for each item in the inventory. If the proportion in each subgroup increases as the subgroup's mean total score

increases, the item as judged to be satisfactory. On the other hand, if the relationship between the item and the total score is definitely non-linear, then this item must not be included in an inventory in which the total is obtained by a simple additive process. To guide decision making about acceptance or rejection of items, Maxwell recommends arranging the data for each item in the form of a 2 x 2 table, i.e., High/Low score by Fav./Unfav. response, the former variable categories being obtained by collapsing a number of the ordered subgroups described above. Items are then rejected if the χ^2 test on this table yields a value which does not reach a pre-set significance level.

These procedures were applied to the 14-item inventory, and resulted in the exclusion of 3 more items, which did not meet the linearity criterion.

All of these three items came from the original 'account of leisure time' list. They referred to the time spent by a child with adults on Saturdays and Sundays, and the degree of mother participation in her child's play on a rainy evening. None of these items bore a linear relationship to the overall score. At the beginning of the study, it would have been predicted that a 'middle class' coding on these variables would tend to be associated with similar codings on the other variables - disciplinary method, chat, supervision of play, and so on, thus leading to a linear relationship with the total score. After collecting the data, it was not hard to see why such relationships were absent.

In many respects, these three items were similar to those

on the role of the father, which had been excluded from the list prior to the statistical analysis. Those items had been excluded then, both because the range of answers had been much narrower than expected, and also because the information was second hand (i.e., mother reporting father's behaviour,) and hence probably inaccurate and incomplete. It was this problem of restricted range of response which was shared by one of the items considered here, together with very low numbers in the most positive category which was found. This was the question on mother participation in play on rainy evenings. The descriptive account of the interview results given in an earlier section described in detail the responses which were obtained to this question. (See page 116.)

The questions about the amount of time spent with adults at weekends missed their mark primarily because what was being tapped was not always what a mother chose to do, but often what circumstances forced her to do. She might have been altogether unwilling to take her children with her on a shopping trip to the local town centre, or to visit a friend for a chat, but if no stand-in was available and she was not prepared to leave them to their own devices for a number of hours, there would be no alternative but to take them along. In a number of interviews, a very strong impression was gained that such unwilling proximity was a regular weekend feature for some mothers.

Eleven items now remained, the majority of which possessed strong face validity as indices of an underlying approach to child-rearing which may, for convenience, be described as 'middle class.'

This matter is discussed further in the next section, which describes the introduction of the reading data into the analysis.

The selected predictors and the reading data

As will be recalled, five items were set aside from the list of potential predictors at an early stage. These items, which were considered to merit special attention, were :

1. Mother's willingness to chat
2. Mother's aspriations for child to stay on at school
3. Mother's own reading
4. Mother reads to child
5. Child reads to mother

In order to maintain continuity of description, the results of the analysis of this data are not presented until the end of this chapter, when consideration of the 11-item list has been completed.

The child-rearing inventory

The eleven items under discussion had by this stage been subjected to a number of sieving operations, and had emerged with a certain plausibility as indices of a 'middle class' approach to child-rearing. The underlying theory behind all this was, of course, that such an approach would be related to above-average progress of the child in school.

The question which it was essential to ask at this stage was therefore: Are 'favourable' responses to these items, when taken individually, all related to high achievement?

To answer this question, stratified histograms were plotted for each item, (Figures 12-22) and the histograms inspected for evidence of any group differences. χ^2 analyses of contingency tables was also carried out. Statistical significance at the 0.05 level was considered too strict a criterion for inclusion here, since some 'easy' and some 'hard' items were wanted in order to discriminate respondents effectively.

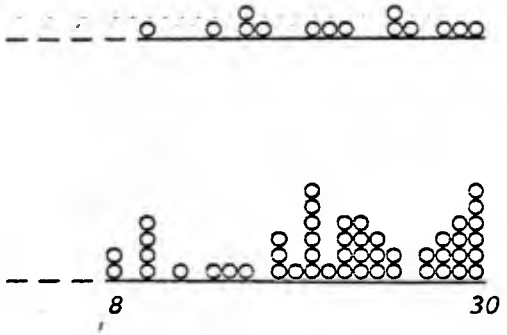
All but two items, after consideration of histogram and crosstabulation evidence, were accepted as exhibiting subgroup differences in the expected direction. The two which showed no such indication were the items about child-centred activities on a Sunday, and about the amount of TV watched by the child. Possible reasons for these findings are discussed at the end of the report of the pilot study.

In one of these two cases, the χ^2 value was only 0.37 in a two by three table, and inspection of the histogram revealed no suggestion at all of a group difference: amount of television watched, it appeared, was unrelated to reading attainment in the present study sample.

In the other case, a larger, but still non-significant χ^2 value was obtained, while inspection of the histogram revealed that a difference, if it existed, was not in the direction predicted: children who were not taken on child-centred outings, it appeared, were not at any disadvantage as far as early reading progress was concerned.

Of the remaining nine items, five produced χ^2 values significant at the 0.01 level. The other four did not show such marked differences in the contingency table analyses,

Figures 12-22. Grouping of Southgate scores for all crosstabulations: Poor (P) 0-15, Medium (M) 16-27 and Good (G) 28-30.



Saturday morning only

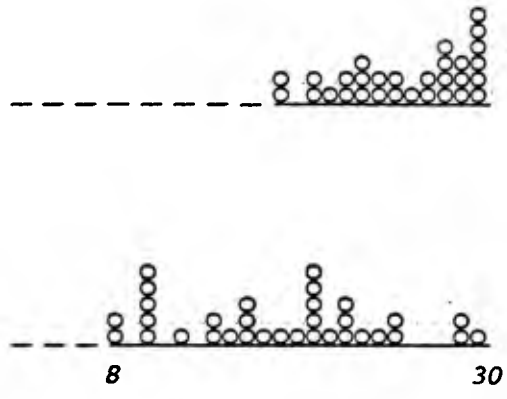
During the week also

Cross-tabulation

P	M	G	
2	9	3	14
9	27	13	49
11	36	16	63

$\chi^2 = 0.37$ with 2 df.
Not significant.

Figure 12. Southgate score by amount of television watched.



Disapprove in general

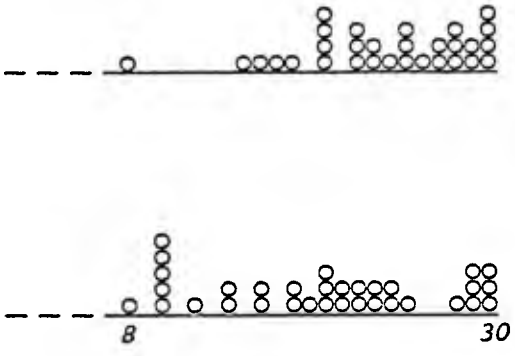
Definitely approve

Cross-tabulation

P+M	G	
17	13	30
30	3	33
47	16	63

With Yates' correction,
$\chi^2 = 8.00$ with 1 df.
$p < .01$

Figure 13. Southgate score by use of TV to occupy children.



Open Day plus

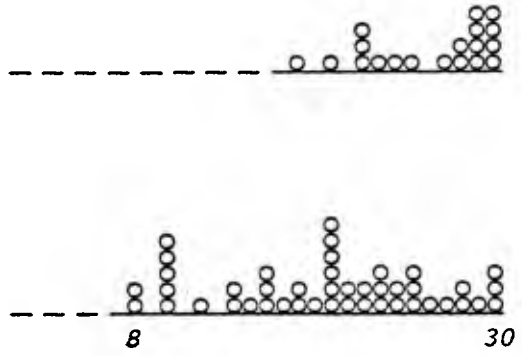
Open Day at most

Cross-tabulation

P	M	G	
2	19	9	30
9	17	7	33
11	36	16	63

$\chi^2 = 4.67$ with 2 df.
$p < .10$

Figure 14. Southgate score by familiarity with school & teachers.



Enquiry made

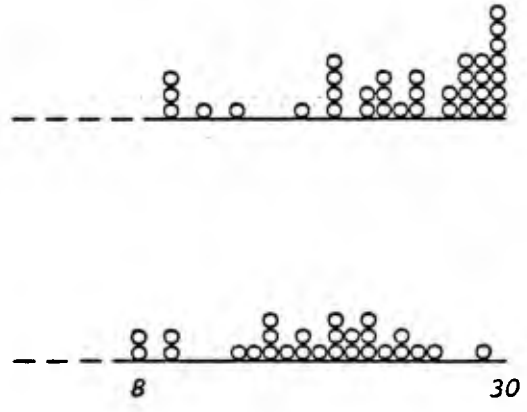
Other

Cross-tabulation

P+M	G	
9	10	19
38	6	44
47	16	63

With Yates' correction,
$\chi^2 = 8.69$ with 1 df.
$p < .01$

Figure 15. Southgate score by familiarity with school work.



Encourages news

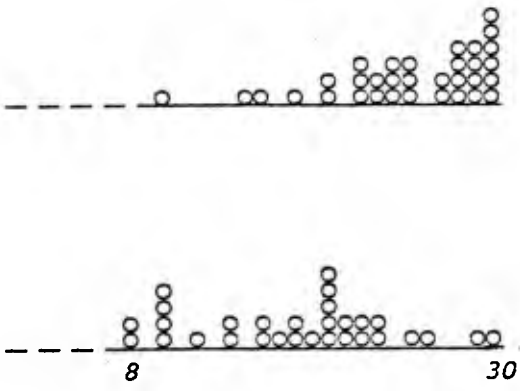
Neutral or discouraging

Cross-tabulation

P	M	G	
5	16	15	36
6	20	1	27
11	36	16	63

$\chi^2 = 11.73$ with 2 df.
$p < .01$

Figure 16. Southgate score by interest in school.



Explaining & coaxing

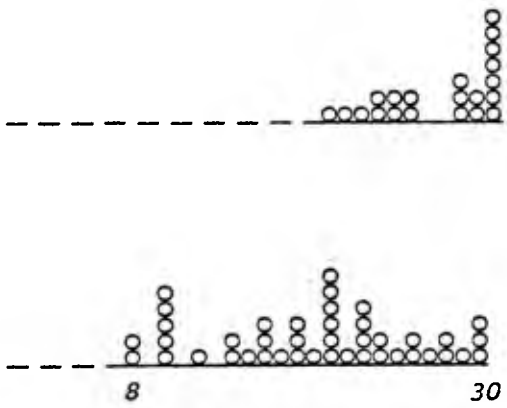
Firmness

Cross-tabulation

P	M	G	
2	17	14	33
9	19	2	30
11	36	16	63

$\chi^2 = 13.45$ with 2 df.
$p < .01$

Figure 17. Southgate score by disciplinary method.



Enthusiastic

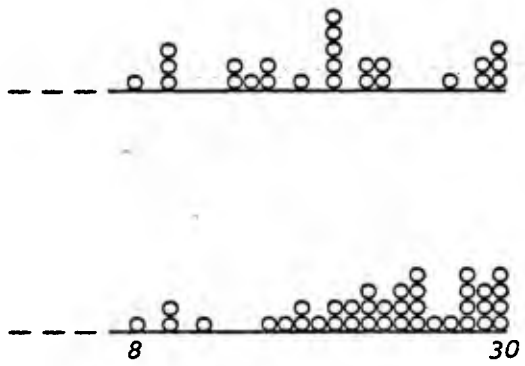
'Good' or uninterested

Cross-tabulation

P+M	G	
9	12	21
38	4	42
47	16	63

With Yates' correction,
$\chi^2 = 14.34$ with 1 df.
$p < .001$

Figure 18. Southgate score by response to good news from school.



Child-centred

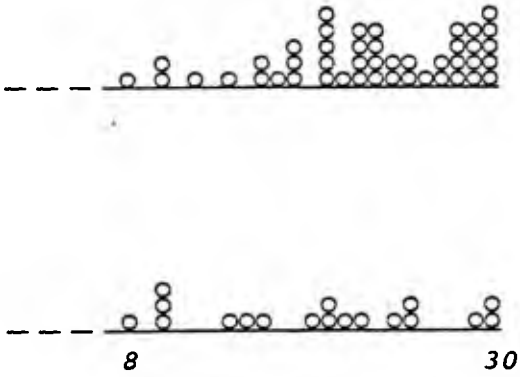
Other, or no outing

Cross-tabulation

P	M	G	
7	13	5	25
4	23	11	38
11	36	16	63

$\chi^2 = 3.30$ with 2 df.
Not significant.

Figure 19. Southgate score by Sunday outing.

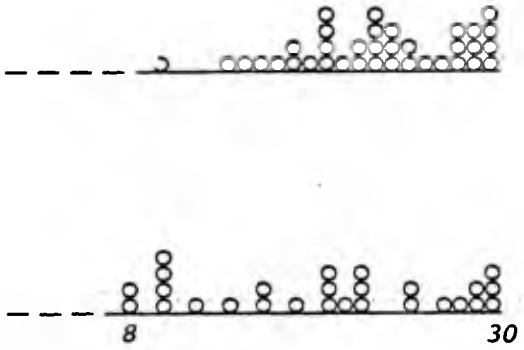


Cross-tabulation

P	M	G	
5	27	13	45
6	9	3	18
11	36	16	63

$\chi^2 = 4.61$ with 2 df.
$p < .10$

Figure 20. Southgate score by 'plays where'.

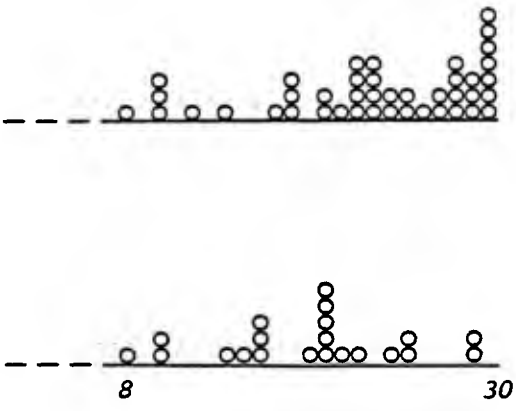


Cross-tabulation

P	M	G	
3	23	10	36
8	13	6	27
11	36	16	63

$\chi^2 = 4.86$ with 2 df.
$p < .10$

Figure 21. Southgate score by 'plays with whom'.



Cross-tabulation

P	M	G	
6	22	14	42
5	14	2	21
11	36	16	63

$\chi^2 = 4.35$ with 2 df.
Not significant.

Figure 22. Southgate score by 'plays for how long'.

but all were in the expected direction. Visual inspection of the histograms supported this conclusion. A score out of nine was, therefore, calculated for each case in the sample, by simple addition of the number of items from the list of nine which had been answered favourably.

The present study was a pilot, and as such, concerned with sifting hypotheses. The nine-item list of factors under current consideration was the end-product of this sifting process. It was recognised that the selection of factors for inclusion in the list was the result of both real and chance differences in the data relating item score to reading ability. Hence, any further analyses using the inventory score would suggest a stronger relationship with attainment than was really the case, owing to this effect of capitalising on chance differences. Applying the ideas 'selected' by the pilot to new data would not be subjected to this limitation, however.

In the full knowledge of these very important provisos, analysis of the inventory score from the pilot data was continued, and is described in the paragraphs which follow.

The nine-item inventory

To recap very briefly, the nine items in question were:

(a) Child plays where
(b) Child plays with whom
(c) Child plays away for how long
(d) Usefulness of TV to mother
(e) Disciplinary method
(f) Mother's interest in school news
(g) Mother's response to good news from school
(h) Mother's familiarity with teachers and school
(i) Mother's familiarity with school work.

As an inventory of 'middle class' child-rearing methods, this list has a certain face validity, which may best be illustrated by imagining two homes, in one of which, all the nine items are answered favourably, and in the other, all are answered negatively.

In the former, the child's mother knows at any time exactly where he is playing and with whom. He is not permitted to stay beyond the immediate vicinity of home, and encouraged to return at intervals so his mothers knows all is well. Indoors, she does not indiscriminately switch on the television as a means of keeping the children 'out of her feet.' She prefers to persuade and coax her child to comply with the things she wants him to do, rather than insist without reason, or compel by means of force. At the end of each school day, she chats with her child about the latest news from school, and always makes a point of praising him if he tells her of some new achievement. This mother does not confine her visits to school to Open Days; she knows her child's teacher, and she is familiar with the work her child is doing.

In the second hypothetical home (not so hypothetical - four of these homes were found,) the child spends virtually all his leisure hours playing in the streets. His mother does not mind if he wanders quite far from home, and she is not concerned if he is absent for long periods of time. She does not know whom he is with. Whenever the child is forced, for whatever reason, to remain indoors, his mother will seek to occupy him with indiscriminate use of the television, which stops him bothering her with demands to be amused. To get him to behave as she wishes, this mother

merely demands compliance, but provides no explanation. She is also likely to use physical forms of coercion and punishment. Talk of school may be actively discouraged at home, or at best, listened to passively. The mother is 'not very interested really' in her child's achievements, but may sometimes summon up a token 'good' if her attention is captured at the right moment. At most, she visits school once a year for Open Day. She has very little idea of the sort of work her child is doing during his school hours, and if she finds she is puzzled by the snippets she hears, she does not feel sufficiently motivated to seek an explanation.

It is appropriate at this point to consider the reliability of the information obtained from a check-list such as this one. Did what the mother say reflect her true behaviour, or was she consciously or subconsciously giving false information? It was beyond the resources of the present study to have the interviews carried out a second time by another interviewer, in order to assess this aspect of reliability, and observation of mothers in their homes was also not a practical proposition: this matter has already been discussed at some length in the earlier chapter on the overall planning of the project.

Although care was taken in interviewing to create no impression that there was a 'right,' i.e., socially acceptable, response, and although the inventory items referred to practices, rather than attitudes or beliefs (which might be even less reliable,) it must be accepted that interview data, used alone, cannot be assumed to be a fully accurate reflection of relevant behaviour. A

large-scale investigation would not, of course, be content with this state of affairs, and would ultimately seek validatory evidence. Even so, a lengthy period of interviewing would presumably be necessary first, if only as a means of directing attention in the most promising directions. It is in this light, i.e., as essentially exploratory research, that the present study must be viewed.

Distribution of inventory scores

The total score on the inventory of child-rearing practices was found to discriminate well amongst the sample members, as is demonstrated in the histogram of scores in Figure 23 below. The mean inventory score for the whole sample was 4.63 with a standard deviation of 2.64 units.

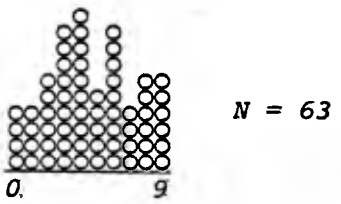


Figure 23. Histogram of Inventory scores

These findings were taken to indicate true variation in child-rearing practices across mothers in a working class area, from a very haphazard and casual approach at one end of the scale to be an involved, thoughtful approach at the other. The similarity of the characteristics

of the latter to a 'middle class' style of upbringing is unmistakeable.

Correlation of reading and inventory scores

As has been pointed out above, the inventory score was, in the final stages, constructed on the basis of observed group differences in reading ability. Its correlation with these same reading scores was, therefore, expected to be artificially high, and certainly not to be relied upon.

The calculated Spearman rank-order correlation coefficient was 0.67. (The Spearman was used because the very skewed distribution of the Southgate reading scores violated the assumptions underlying the use of parametric measures such as the Pearson.) The scattergram of inventory and reading scores is given in Appendix 3.

Replication of this calculation, using inventory and reading scores from a new sample, would be expected to yield a considerably lower figure than the one reported above. This procedure was carried out, and is reported in a later chapter.

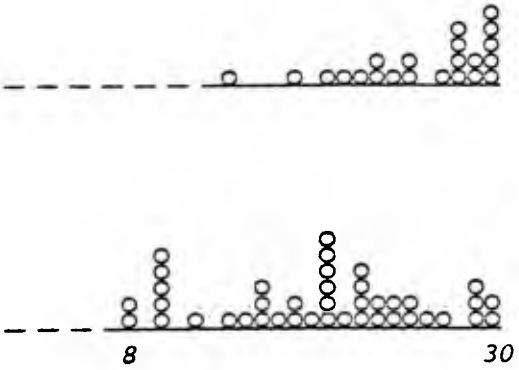
The remainder of the interview data

Moving on for the present to a consideration of the five items which were isolated earlier from the interview findings, the stratified histograms of the reading scores are presented for each of these variables in Figures 24-28 below, together with the relevant crosstabulation tables and χ^2 results.

Four of the variables showed highly significant

subgroup differences in reading scores. The fifth - mother's own reading, i.e. provision of a reading model - had only 15 cases in its 'favourable' category, so the histogram evidence was hard to assess. The contingency table analysis revealed a difference which was not significant, but in the predicted direction.

Figures 24-28. Grouping of Southgate scores for all crosstabulations: Poor (P) 0-15, Medium (M) 16-27 and Good (G) 28-30.

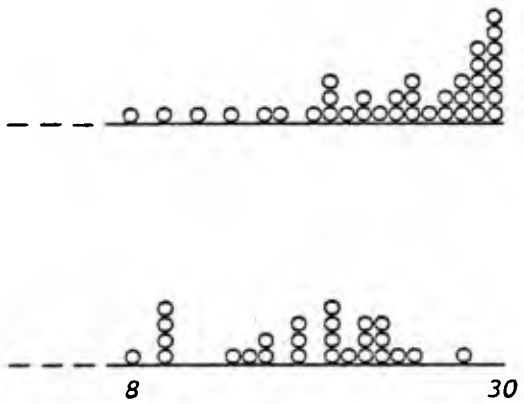


Cross-tabulation

P	M	G	
1	10	11	22
10	26	5	41
11	36	16	63

$\chi^2 = 12.08$ with 2 df.
$p < .01$

Figure 24. Southgate score by mother's willingness to chat.

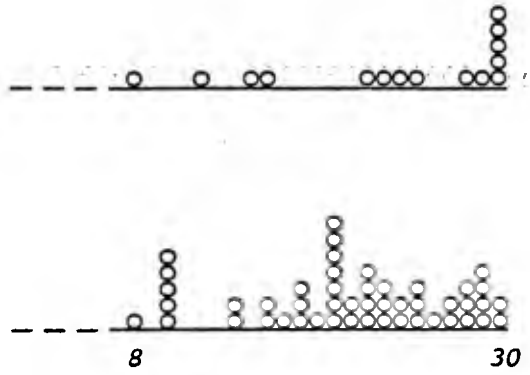


Cross-tabulation

P	M	G	
4	18	15	37
7	18	1	26
11	36	16	63

$\chi^2 = 11.50$ with 2 df.
$p < .01$

Figure 25. Southgate score by mother's aspirations.

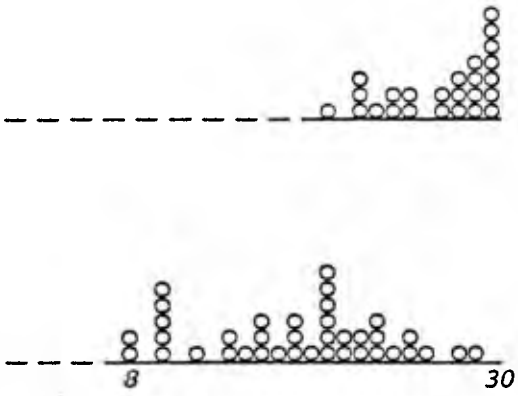


Cross-tabulation

P	M	G	
3	5	7	15
8	31	9	48
11	36	16	63

$\chi^2 = 5.53$ with 2 df.
Not significant.

Figure 26. Southgate score by mother's own reading.

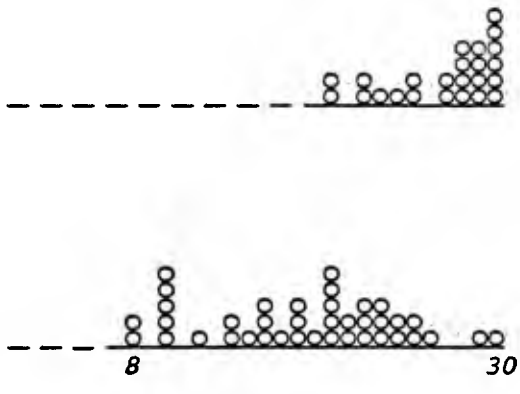


Cross-tabulation

P+M	G	
11	14	25
36	2	38
47	16	63

With Yates' correction, $\chi^2 = 17.90$ with 1 df.
$p < .001$

Figure 27. Southgate score by mother reads to child.



Cross-tabulation

P+M	G	
10	14	24
37	2	39
47	16	63

With Yates' correction, $\chi^2 = 19.48$ with 1 df.
$p < .001$

Figure 28. Southgate score by child reads to mother.

Overlap of Predictors

The crucial question to which an answer needed to be sought at this point was: to what extent were the different items selecting the same people as members of the 'favourable response' subgroup? In other words, do mothers with high aspirations only have successful children because they are also willing to chat or give direct help, for example?

The problems of disentangling such a web of influences have already been touched upon. For the pilot analysis, neither the sample size nor the nature of the data merited complex statistical treatment, so the emphasis upon non-parametric analyses was retained as before. Histograms, this time with two-way stratifications, were again plotted and inspected, and this visual evidence used in conjunction with the results of statistical analyses.

Two types of disentanglement needed to be carried out - one within the 'proximal' group of predictors, (see page 134,) such as the example given above for the effect of high aspirations, and the other to relate the influence of proximal factors to demographic variables, primarily social class. The influence of school attended would be studied under this latter category also.

Overlap of non-demographic predictors

The aim of this exercise was to compare the predictive power of the variables based on well-established ideas - mother's willingness to chat, her aspirations, and the

reading model she provided - with that of the relatively novel predictors, such as direct help given with reading, and the style of child-rearing employed. Since the last mentioned was a scale measure, range 0 to 9, while the others were all single-item dichotomous indices, the exact type of comparison varied, depending on whether two non-metric, or one metric and one non-metric variable were being compared.

The overlap of the non-metric variables is considered first. Answers were sought primarily to the following specific questions:

1. Do mothers with high aspirations also tend to have favourable codings on the other variables, such as the measures of willingness to chat, providing a reading model, and giving direct help; and if so, to what extent is the influence of 'aspirations' on reading performance mediated by these different factors?
2. Do the two types of direct help tend to go together?
3. 'Chat' and 'direct help' (of two kinds) are the variables most closely related to reading score: to what extent do they overlap, and how large is the unique contribution of each, over and beyond the effects of the other?

Mothers with high aspirations

Crosstabulation tables were produced, linking in turn the measure of 'aspirations' with those of 'willingness to chat,' 'mother's own reading,' 'mother reads to child' and 'child reads to mother.' (Tables 20-23)

Table 20. Aspirations by willingness to chat

ASP	CHAT: UNWILLING (0)	LIKES TO CHAT (1.)	ROW TOTAL
LOW (0)	23	3	26
	88.5	11.5	41.3
	56.1	13.6	
	36.5	4.8	
HIGH (1.)	18	19	37
	48.6	51.4	58.7
	43.9	86.4	
	28.6	30.2	
COLUMN TOTAL	41	22	63
	65.1	34.9	100.0

CORRECTED CHI SQUARE = 8.97035 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = .0027
PHI = .41116

Table 21. Aspirations by Mother's own reading

ASP	MTOM: DOES NOT READ (0)	READS BOOKS (1.)	ROW TOTAL
LOW (0)	21	5	26
	80.8	19.2	41.3
	43.8	33.3	
	33.3	7.9	
HIGH (1.)	27	10	37
	73.0	27.0	58.7
	56.3	66.7	
	42.9	15.9	
COLUMN TOTAL	48	15	63
	76.2	23.8	100.0

CORRECTED CHI SQUARE = .17211 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = .6782
PHI = .09012

Table 22. Aspirations by Mother reads to child

ASP	MTOC: USED TO OR NEVER (0)	DOES STILL (1.)	ROW TOTAL
LOW (0)	24	2	26
	92.3	7.7	41.3
	63.2	8.0	
	38.1	3.2	
HIGH (1.)	14	23	37
	37.8	62.2	58.7
	36.8	92.0	
	22.2	36.5	
COLUMN TOTAL	38	25	63
	60.3	39.7	100.0

CORRECTED CHI SQUARE = 16.72070 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = .0000
PHI = .54813

Table 23. Aspirations by Child reads to mother

ASP	CTOM: USED TO OR NEVER (0)	DOES STILL (1.)	ROW TOTAL
LOW (0)	23	3	26
	88.5	11.5	41.3
	59.0	12.5	
	36.5	4.8	
HIGH (1.)	16	21	37
	43.2	56.8	58.7
	41.0	87.5	
	25.4	33.3	
COLUMN TOTAL	39	24	63
	61.9	38.1	100.0

CORRECTED CHI SQUARE = 11.39139 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = .0007
PHI = .45842

(For convenience, in the following tables and discussion, the abbreviated variable names 'Asp,' 'Chat,' 'MtoM,' 'MtoC'and 'CtoM' are used to refer to the variables listed above.)

It may be seen (page 174-5) that the three variables which were significantly related to reading score also showed an association with the mother's level of aspiration. Mother's own reading('MtoM') showed the least evidence of having any influence on reading score, and was also unrelated to the mother's level of aspiration for her child.

The numbers are small and the analysis crude, but this result deserves attention because it runs counter to popular belief. When teachers talk of the 'cultural level' of a child's home, one of the principal things they are referring to is the reading habits of the child's parents. They then go on to assume a connection between this aspect of a 'good home,' and the progress of the child in school. The fuller discussion which this topic deserves is to be found in Chapter 6. For the present, only a brief diversion will be made from the main theme to consider if a mother's personal reading habits are related to other variables of more demonstrable educational significance.

Crosstabulations were performed of 'reading model provided' by 'chat,' by 'mother readsto child' and by 'child reads to mother.'

(See Tables 24-26)

Table 24. Mother's own reading by willingness to chat

MTOM	CHAT: 0 (UNWILLING)	CHAT: 1 (LIKES TO CHAT)	ROW TOTAL
0 DOES NOT READ	31	17	48
	64.6	35.4	76.2
	75.6	77.3	
	49.2	27.0	
1. READS BOOKS	10	5	15
	66.7	33.3	23.8
	24.4	22.7	
	15.9	7.9	
COLUMN TOTAL	41	22	63
	65.1	34.9	100.0

CORRECTED CHI SQUARE = .02641 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = .8709
PHI = .01851

Table 25. Mother's own reading by Mother reads to child

MTOM	MTOC: 0 (USED TO OR NEVER)	MTOC: 1 (DOES STILL)	ROW TOTAL
0 DOES NOT READ	32	16	48
	66.7	33.3	76.2
	84.2	64.0	
	50.8	25.4	
1. READS BOOKS	6	9	15
	40.0	60.0	23.8
	15.8	36.0	
	9.5	14.3	
COLUMN TOTAL	38	25	63
	60.3	39.7	100.0

CORRECTED CHI SQUARE = 2.37265 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = .1235
PHI = .23215

Table 26. Mother's own reading by Child reads to mother

MTOM	CTOM: 0 (USED TO OR NEVER)	CTOM: 1 (DOES STILL)	ROW TOTAL
0 DOES NOT READ	30	18	48
	62.5	37.5	76.2
	76.9	75.0	
	47.6	28.6	
1. READS BOOKS	9	6	15
	60.0	40.0	23.8
	23.1	25.0	
	14.3	9.5	
COLUMN TOTAL	39	24	63
	61.9	38.1	100.0

CORRECTED CHI SQUARE = .01704 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = .8961
PHI = .02193

Taken on its own, the reading model provided by a child's mother was found earlier to show very little evidence of an association with reading attainment. It now appears to be also unrelated to aspects of the child's home which do show an association with performance. The assumptions commonly made about the value of an adult 'reading model' in a child's home must be questioned as a result of such findings. Further investigations are required.

In the present analysis, no further attention was paid to this variable.

Returning to the main theme, the next question to be asked was whether the behavioural variables which had been found to be related to level of aspiration, were responsible for the effect of 'aspiration' on attainment score.

The procedure followed here was to plot histograms of reading scores, stratified by the four subgroups formed by two-way crosstabulation. Histograms for 'Asp' times 'Chat,' 'Asp' times 'MtoC' and 'Asp' times 'CtoM' were plotted, and are shown in Figures 29-31 below.

Visual inspection of these histograms strongly suggests that the overall effect of 'Asp' on reading is in large part explained by the child-rearing practices (in the widest sense) which are associated with the different levels of aspiration. It is not correct to say that mothers with high aspirations for their children tend to do something to further those ambitions, because that is not where the association lies. Out of 37 mothers who stated

high aspirations, only 19 were happy to spend time chatting to their child, 23 to read to him and 21 to listen to him read. In other words, high aspirations are no guarantee of beneficial practices. The opposite case can be made more strongly however. Mothers with stated low aspirations - the minority - are highly unlikely to exhibit beneficial practices. 3 out of 26 chatted, 2 read to their child, and 3 listened to him read.

In Chapter 1, the problems of disentangling influences which tend to be associated with one another were discussed theoretically. The present analysis is a good example of meeting those problems in practice. Considering 'Asp' and 'MtoC,' for example, it would be interesting to know if, holding 'MtoC'constant, an effect of 'Asp' could be demonstrated within each 'MtoC' level. This is feasible within the lower level of 'MtoC,' but not in the upper, because only two cases of low 'Asp' are to be found there. For this reason, no quantitative analysis of this data was carried out. (Further, it is not possible to know how atypical of mothers who help are these low aspirations cases: perhaps the quality of their direct help is not comparable to that given by women motivated by high aspirations.)

The most which can be said is that, in none of these three examples - 'Chat,' 'MtoC' and 'CtoM' - do the small minority of exceptional cases in the upper level come from the top end of the reading distribution. No mother of a child who reached the ceiling of the reading test had a low level of aspiration; or to put it another way, no mother who gave help, but in a context of low aspiration, had a child who reached the ceiling of the reading test.

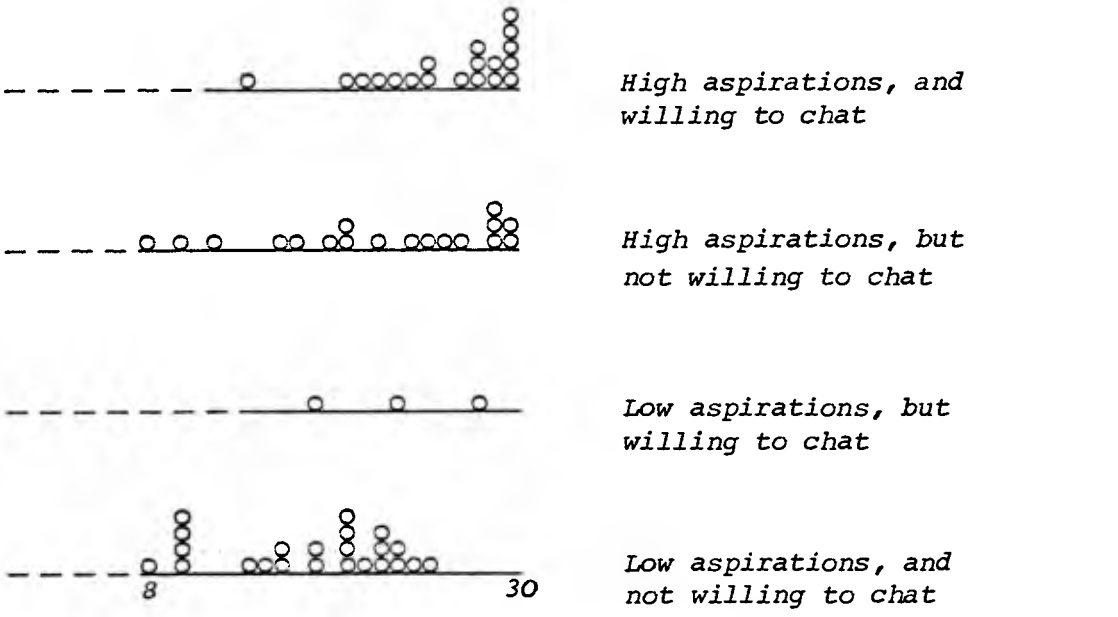


Figure 29. Two-way reading score histogram: aspirations x willingness to chat.

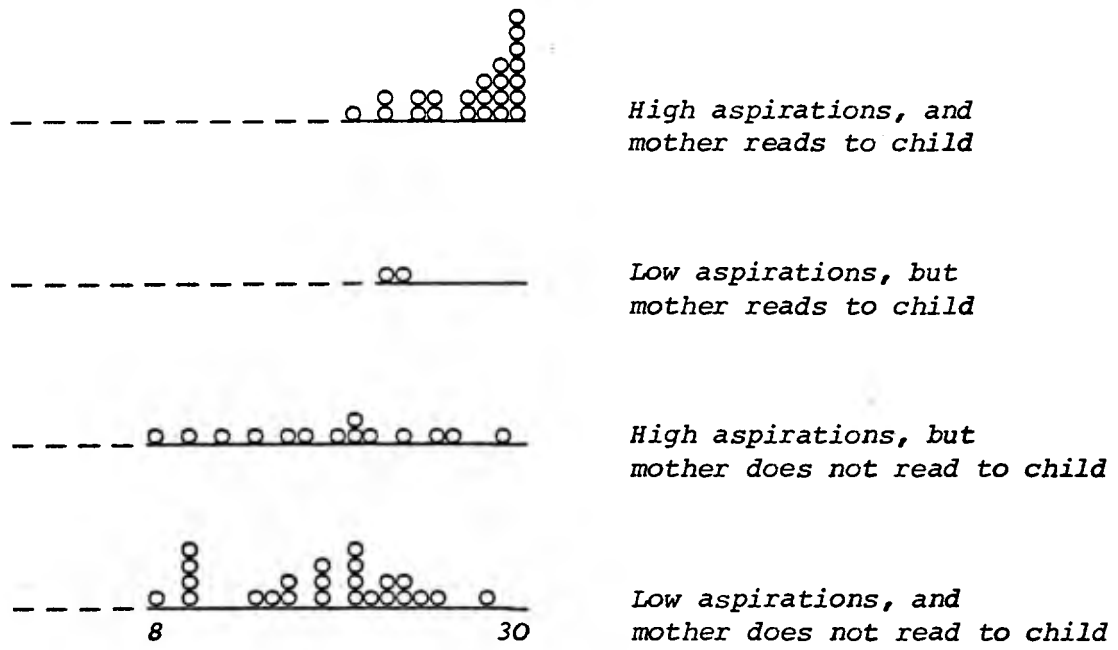


Figure 30. Two-way reading score histogram: aspirations x mother reads to child.

A much larger sample would be needed before any reliance could be placed on such a statement however.

Within the lower level of each of the three variables in question, high aspirations did not appear to have any effect on reading score - a hint of a trend in the right direction for 'Chat' and 'CtoM' perhaps, but no more. Data from a larger sample would be needed to take any further the process of separating out the confounding influences revealed here.

Direct help with reading

Two different types of help have been considered in all the analyses so far: 'child reads to mother' and 'mother reads to child.' Inspection of the relevant histograms reveals that the pattern of results for these two variables is remarkably similar. The question was once again asked, therefore: to what extent are these two variables picking out the same groups of people? The crosstabulation table below needs no statistical test to provide an answer to that question. The great majority of women who are picked out as belonging to the 'favourable' category on one of these variables are similarly classified on the other.

TABLE 27

'Child reads to mother' by 'Mother reads to child'

		Child reads to mother		
		No	Yes	
Mother reads to child	No	35	3	38
	Yes	4	21	25
		39	24	

Corrected $\chi^2 = 33.88$ with 1 df. $p < .001$

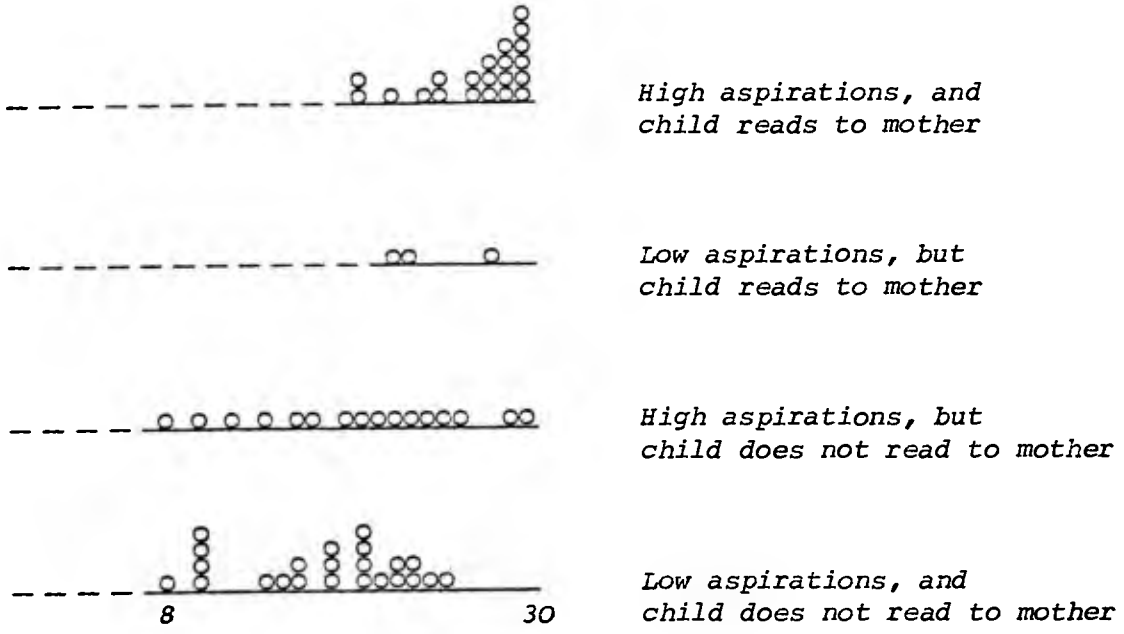


Figure 31. Two-way reading score histogram: aspirations x child reads to mother.

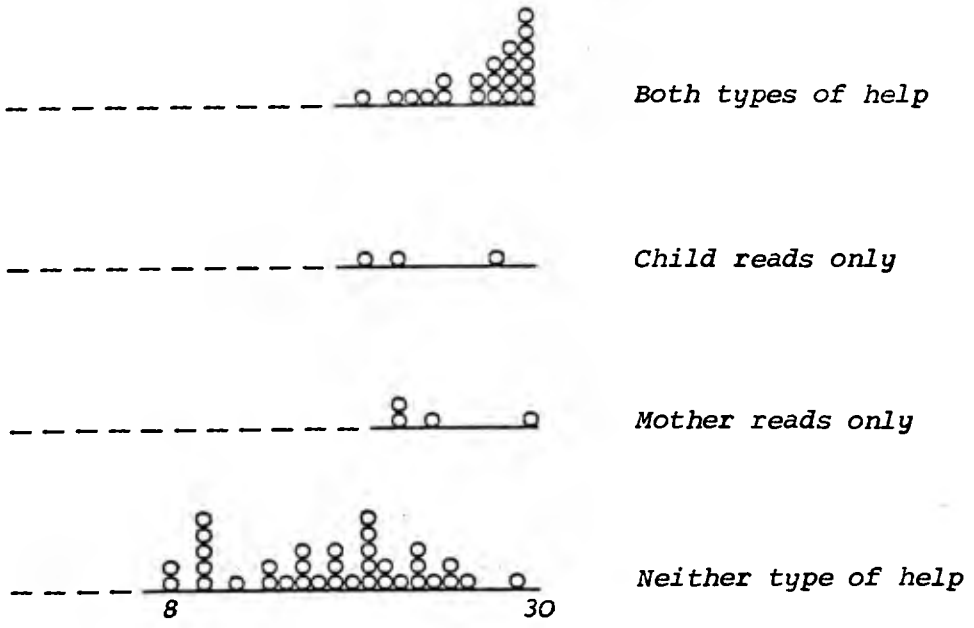


Figure 32. Two-way reading score histogram: mother reads to child x child reads to mother.

Unfortunately, the extreme degree of association makes it impossible to disentangle the separate influences on a sample of this size. The two-way stratified histogram of reading scores was plotted, (and is shown in Figure 32) just in case any suggestion of a difference might emerge. It did not, and the relative importance of the two types of help could not be established from this data. What was beyond question was that direct help with reading at home was the best predictor of reading attainment to emerge from the pilot analysis - better than the mother's willingness to chat to her child, or the reading model she provided. It was also the most important mechanism, of those studied here, by which the variable of parental aspiration exerted an influence on school achievement.

To some, this finding might seem an obvious one; practice and assistance with reading improve performance. In the eyes of most teachers, however, such simplicity of thinking would be seen rather as naïvety. Reading is a complex skill, and teaching children this skill requires expertise and professional knowledge, which can only be acquired as the result of long training. Parental involvement in the acquisition of reading skills is 'interfering.' It is bound to cause confusion, and will do more harm than good. So runs the argument - but it has never satisfactorily been put to the test. It is clear that the evidence of the present study is much more in accord with what would be expected on the basis of 'common sense' than with the teachers' argument. At this point, discussion of the issues raised is adjourned until a later chapter.

The overlap of 'Chat' and the forms of direct help

All three variables included here were good predictors of reading score when taken individually, but again, it is necessary to ascertain the degree of overlap in terms of cases selected, and then to take the further step of seeing if, for example, children who received help with reading were better readers not because of this fact per se, but rather because their mothers tended also to have beneficial habits of language use, and it was the latter which was the 'true' predictor.

The same procedure was followed as before. Cross-tabulation (see Tables 28 and 29) revealed a substantial area of overlap in both cases, but this time, the 'off-diagonal' cell sizes were a little larger, and more information could be gained from inspection of the histo-grams (Figures 33 and 34.) As before, the two direct help variables yielded very similar results. No attempt will, therefore, be made at present to distinguish further between the two, and discussion will be in non-specific terms, i.e., reference will be made to 'direct help,' rather than a specific form of help.

The most striking finding was that, within both 'Chat' categories, there was still an observable effect of the 'direct help' variable. (As may be seen by comparing adjacent lines on the histograms.) However, within the 'help' categories, the same cannot be said for the effect of 'chat.' Within the group of children who received direct help, whether or not the mother gained a favourable score on 'chat' appeared to make no difference to reading

attainment. Within the 'no direct help' group, there was only a faint suggestion of a 'chat' effect. On the whole, the group of children who were chatted to, but not given direct help with reading, were more similar to the group who received neither benefit than to either of the groups which received help. Put another way, when the children who received help were separated out from the favourable 'chat' category, and the two subgroups examined individually, it was clear that it was the children who were given help who raised the overall score of the 'favourable' group on the 'chat' variable.

Since the groups formed by the present two-way classification were less extreme than previously, and since the topic was a particularly controversial one, a two-way parametric analysis of variance was carried out on the reading data broken down in this way.

(In the sections to follow the analyses using the 'Child reads to mother' variable are described. The parallel analyses using 'Mother reads to child,' are presented in Appendix 3.)

The Anova summary table is given in Table 30 below. The Anova carried out was a conventional one, in that the contribution of each main effect was assessed while controlling for the other. That is why the sums of squares for the two effects do not give the full 'main effects' total when added together, the discrepancy representing the area of overlap between the two variables' contributions, which is 'partialled out' on both main effects estimates. The result is a conservative estimate of both main effects. (See further discussion of this topic in Chapter 3.)

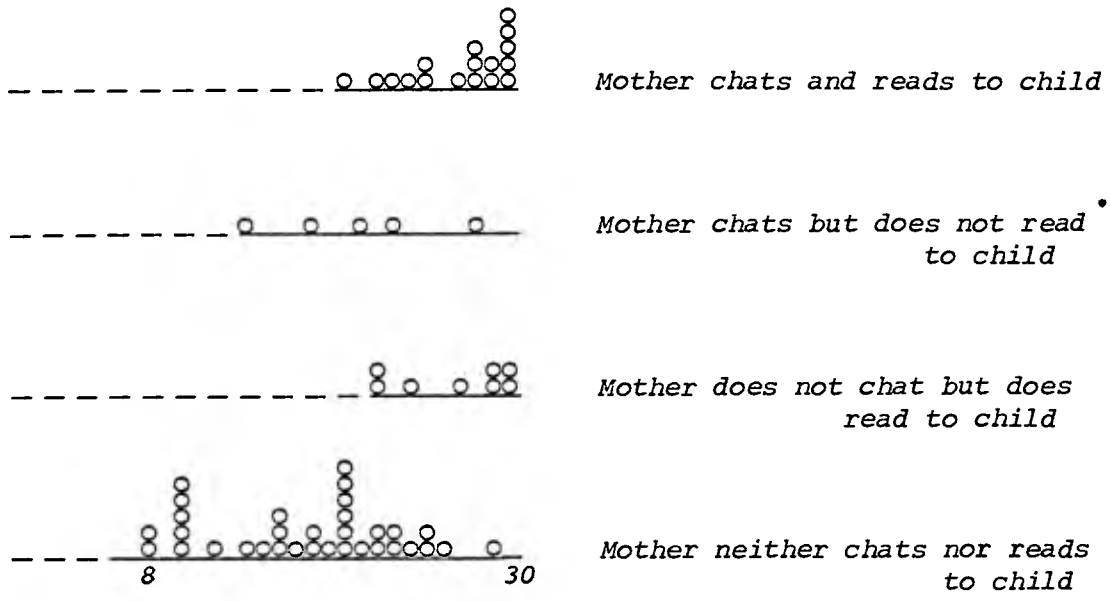


Figure 33. Two-way reading score histogram: willingness to chat x mother reads to child.

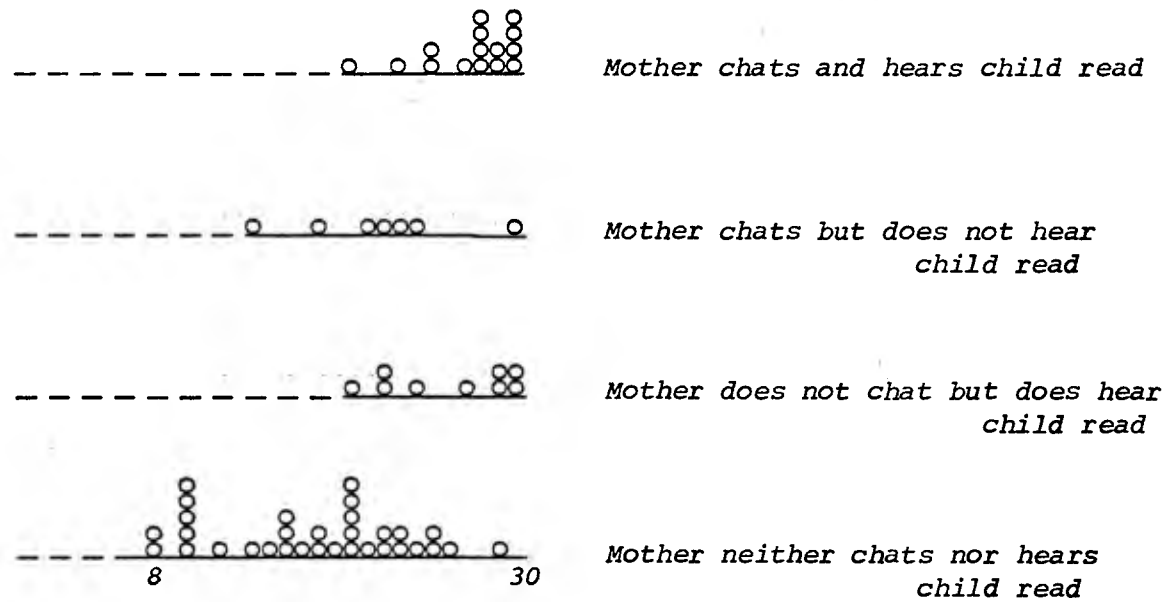


Figure 34. Two-way reading score histogram: willingness to chat x child reads to mother.

Table 28. Chat by Mother reads to child

	MTOC		
COUNT / ROW PCT / COL PCT / TOT PCT	USED TO OR NEVER 0	DOES STILL 1	ROW TOTAL
CHAT 0 UNWILLING OR PASSIVE	33 / 80.5 / 86.8 / 52.4	8 / 19.5 / 32.0 / 12.7	41 / 65.1
CHAT 1. LIKES TO CHAT	5 / 22.7 / 13.2 / 7.9	17 / 77.3 / 68.0 / 27.0	22 / 34.9
COLUMN TOTAL	38 / 60.3	25 / 39.7	63 / 100.0

CORRECTED CHI SQUARE = 17.61634 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = .0000
PHI = .56282

Table 29. Chat by Child reads to mother

	CTOM		
COUNT / ROW PCT / COL PCT / TOT PCT	USED TO OR NEVER 0	DOES STILL 1	ROW TOTAL
CHAT 0 UNWILLING OR PASSIVE	32 / 78.0 / 82.1 / 50.8	9 / 22.0 / 37.5 / 14.3	41 / 65.1
CHAT 1. LIKES TO CHAT	7 / 31.8 / 17.9 / 11.1	15 / 68.2 / 62.5 / 23.8	22 / 34.9
COLUMN TOTAL	39 / 61.9	24 / 38.1	63 / 100.0

CORRECTED CHI SQUARE = 11.08937 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = .0009
PHI = .45383

Table 30. Analysis of Variance: Reading score by Chat x CtoM

* * * * * * * * * * A N A L Y S I S O F V A R I A N C E * * * * * * * * * *

SGATE SOUTHGATE READING TEST SCORE
BY CTOM CHILD READS TO MOTHER
CHAT MOTHERS WILLINGNESS TO CHAT

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS	1122.243	2	561.121	23.411	.001
CTOM	601.084	1	601.084	25.078	.001
CHAT	84.934	1	84.934	3.544	.065
2-WAY INTERACTIONS	18.495	1	18.495	.772	.383
CTOM CHAT	18.495	1	18.495	.772	.383
EXPLAINED	1140.738	3	380.246	15.865	.001
RESIDUAL	1414.120	59	23.968		
TOTAL	2554.857	62	41.207		

63 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

* * * M U L T I P L E C L A S S I F I C A T I O N A N A L Y S I S * * *

SGATE SOUTHGATE READING TEST SCORE
BY CTOM CHILD READS TO MOTHER
CHAT MOTHERS WILLINGNESS TO CHAT

GRAND MEAN = 21.62

VARIABLE + CATEGORY	N	UNADJUSTED DEV'N	UNADJUSTED ETA	ADJUSTED FOR INDEPENDENTS DEV'N	ADJUSTED FOR INDEPENDENTS BETA	ADJUSTED FOR INDEPENDENTS + COVARIATES DEV'N	ADJUSTED FOR INDEPENDENTS + COVARIATES BETA
CTOM							
0 USED TO OR NEVER	39	-3.18		-2.72			
1 DOES STILL	24	5.17		4.42			
			.64		.54		
CHAT							
0 UNWILLING OR PASSIVE	41	-2.11		-.95			
1 LIKES TO CHAT	22	3.93		1.78			
			.45		.20		

MULTIPLE R SQUARED .439
MULTIPLE R .663

The interaction between the two variables was found to be non-significant, despite suspicions to the contrary in the discussion above. The effect of 'direct help'remained significant at the 0.001 level, but the effect of the 'chat' variable did not reach significance, even at the 0.05 level.

One further set of figures had been requested from the computer Anova program, and that was the so-called 'Multiple Classification Analysis,' (MCA), presented beneath the Anova Table in Table 30. Anovas provide the statistics necessary for significance testing: sub-group means must always be consulted to ascertain the direction of any significant effect found. However, in a two-way classification, if the grouping variables are inter-related, then the subgroup means of each of the factors are the end-product of the two confounded effects.

The first column of the MCA printout gives these unadjusted category means, expressed as deviations from the grand mean. The second column gives the category deviations after adjusting for the other factor.

The MCA table in Table 30 reveals that, when the confounding effects of direct help (specifically, 'CtoM' in the analysis presented) are adjusted for, the difference made to mean reading score by willingness to chat is reduced from a six-point advantage to a less than three point advantage. When the confounding effects of 'Chat' are adjusted for, the difference made to mean reading score by the 'direct help' factor is reduced from an eight point advantage to a seven point advantage. Only in the latter case does the 'adjusted' advantage remain statistically

significant.

"Finally," to quote from the SPSS computer program manual, "the multiple R at the bottom of the table indicates the overall relationship between the criterion variable and the independent variables. R^2 in the second column represents the proportion of variance in (reading) explained by the additive effects of ('Chat' and direct help.)" (Nie et al 1975, page 410.)

Returning to the interpretation of these findings, it must be stressed once again that only very rough measures were used, and the numbers involved were small. Nonetheless, the inescapable conclusion is that, although the 'Chat' variable, when looked at in isolation, is related to reading attainment - as Bernstein's theory would predict - further analysis raises doubts about the validity of this finding. In particular, it must be said that, until alternative explanations of the association of 'chat' with reading success have been sought and tested, then the validity of the 'chat' effect must be regarded with some suspicion.

The relationship of the child-rearing inventory to other home background factors

The inventory was intended as a check-list of 'middle class' practices. It was, therefore, important to know if mothers who are 'middle class' on this index are equally so on the other measures: do they chat to their children, have high aspirations for them, and give them help with their school work?

Using inventory score as the dependent variable,

stratified histograms (Figures 35 -37) were plotted for each of these factors in turn, and examined for evidence of group differences. (Only one 'direct help' variable was plotted, since the similarity between the two was so great.)

Mothers who chatted to their children were found to have higher inventory scores than those who did not. The same was true for mothers who had high aspirations for their children, and for mothers who gave their children help with school work.

A series of t-tests was performed, and supported the conclusions derived from visual inspection of the histograms. The results are summarised in Table 31 below.

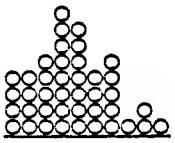
TABLE 31

Inventory score as criterion variable
(range 0-9)

Grouping variable	'Unfavourable' group mean	'Favourable' group mean	t (with 61 df	p
Chat	3.61	6.54	4.95	< .001
Asp	3.19	5.65	4.07	< .001
CtoM (direct help)	3.49	6.50	5.27	< .001

While contributing to the external validity of the inventory - it would be suspicious of mothers with so-called 'middle class' child-rearing practices did not have other 'middle class' characteristics also - the association between inventory score and the other home environment indices draws attention back to the old problem of variables

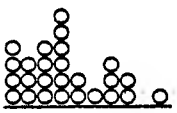
Enjoys chat



Other

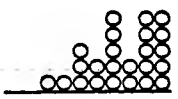
Figure 35. Child-rearing inventory score by mother's willingness to chat.

Enthusiastic

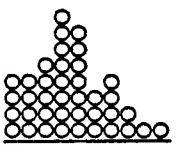


Other

Figure 36. Child-rearing inventory score by mother's aspirations.



Regular help



Other

Figure 37. Child-rearing inventory score by child reads to mother.

'borrowing' effects from each other. Do mothers with high inventory scores tend to have children who are good readers because child-rearing methods are related to fitting in to school, and hence to reading; or does the association only exist because high scoring mothers tend to have other favourable characteristics, which are the real influences on reading attainment?

According to previous analyses, both the 'Chat' and 'Asp' variables relied for much of their effect on their association with the 'direct help' variables. It was, therefore, decided to limit analysis of the inventory scores to seeing if the same sort of association was responsible for the correlation between reading and inventory scores.

The simplest way of doing this was to control for level of help, then to see if the inventory/reading score correlation held up within help group. This procedure was adopted, with the following results:

Within 'favourable' help group (specifically, 'CtoM')

Spearman correlation of inventory score with reading = 0.44

Within 'unfavourable' help group

Spearman correlation of inventory score with reading = 0.52

(The correlation had been 0.67 in the two subgroups combined.)

Both of the subgroup coefficients were significant at the 0.02 level, indicating that not all the inventory effect was 'borrowed' from the more powerful predictor of 'direct help.'

Only the final stage in the analysis of the pilot data now remained to be carried out. This was to investigate the relationship of the variables considered above

to the demographic characteristics of the family, and to attempt to relate reading score to combinations of both these sorts of variables.

Relationship of demographic and behavioural predictors

The only demographic variable which was found to be related to reading attainment in the present sample was social class.

Group differences in reading attainment were also found on the variable 'school attended.'

The question which this section of the analysis sought to answer was: can either of the above effects be explained to some extent by an unequal distribution of favourable child-rearing practices (in the wider sense) across the groups being compared?

Information was also sought more for descriptive than explanatory purposes, on differences in child-rearing practices between other demographic categories. This information was believed to be of interest, irrespective of educational considerations. So, for example, while there was no significant sex effect on reading attainment in the present sample, it was still of interest to know whether child-rearing methods tended to differ for boys and girls. It might be expected, for instance, that mothers would have higher educational aspirations for their sons than for their daughters, especially since this was a working class area. Answers were sought to a number of questions such as this, picked out as being of special interest.

Social class, behavioural predictors and reading

In order to determine if social class differences in reading attainment stemmed in part from an unequal distribution of favourable child-rearing practices across social class groups, it was first necessary to demonstrate that class differences in practice did exist.

Beginning with the two variables shown to be the best predictors of reading - the two sorts of 'direct help given' - their distribution across the social class groups was determined, and χ^2 tests carried out on the resulting crosstabulations, as shown in Tables 32 and 33, below.

It was concluded that there was a significant difference in the distribution of this educationally favourable practice across social class groups, with a suggestion that the fall-off was particularly marked on going from the skilled to the semi- and unskilled working class groups.

The other home variable shown to be related to reading score, independently of the help factor, was the child-rearing inventory score. A stratified histogram was plotted, with inventory score as the dependent variable, to see if the social class groups differed on this measure. (Figure 38.) (Since the inventory was one of supposed 'middle class' practices, it was of particular relevance to see if inventory score was related to social class as such.)

Inspection of the histogram revealed a concentration

Table 32. Class by Child reads to mother

CLASS	CTOM: USED TO OR NEVER	DOES STILL	ROW TOTAL
1. NON MANUAL	6	8	14
	42.9	57.1	22.2
	15.4	33.3	
	9.5	12.7	
2. SKILLED MANUAL	11	10	21
	52.4	47.6	33.3
	28.2	41.7	
	17.5	15.9	
3. SEMI AND UNSKILL	22	6	28
	78.6	21.4	44.4
	56.4	25.0	
	34.9	9.5	
COLUMN TOTAL	39	24	63
	61.9	38.1	100.0

RAW CHI SQUARE = 6.25962 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .0437
CRAMER'S V = .31521

Table 33. Class by Mother reads to child

CLASS	MTOC: USED TO OR NEVER	DOES STILL	ROW TOTAL
1. NON MANUAL	5	9	14
	35.7	64.3	22.2
	13.2	36.0	
	7.9	14.3	
2. SKILLED MANUAL	11	10	21
	52.4	47.6	33.3
	28.9	40.0	
	17.5	15.9	
3. SEMI AND UNSKILL	22	6	28
	78.6	21.4	44.4
	57.9	24.0	
	34.9	9.5	
COLUMN TOTAL	38	25	63
	60.3	39.7	100.0

RAW CHI SQUARE = 7.99105 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .0184
CRAMER'S V = .35615

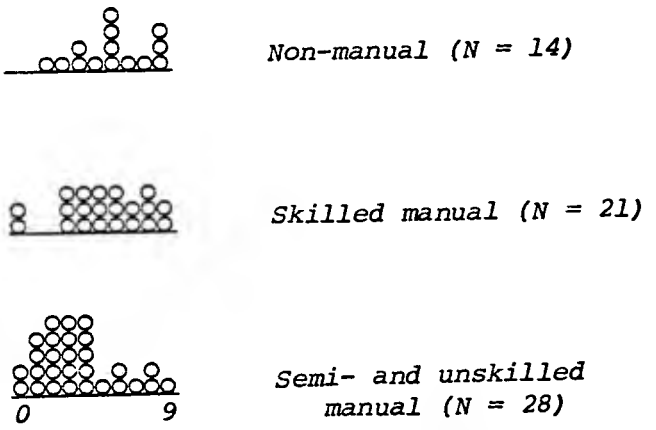


Figure 38. Inventory score by social class

of low inventory scores (i.e., very few 'middle class' practices) in the lowest social group. Harder to estimate was any difference between the III NM and III M groups.

A one-way analysis of variance was carried out on this data, and confirmed that the class groups did differ significantly in inventory score. ($F = 5.80$ with 2,60 df. $p < 0.01$.)

Having established that the social class groups did differ, within the present sample, on educationally relevant aspects of the home environment, it was then necessary to see how far these differences accounted for the established social class gradient in reading achievement within the sample.

As a first step, stratified histograms of reading scores were plotted, broken down jointly by social class and by 'direct help given.' (See Figures 39 and 40.)

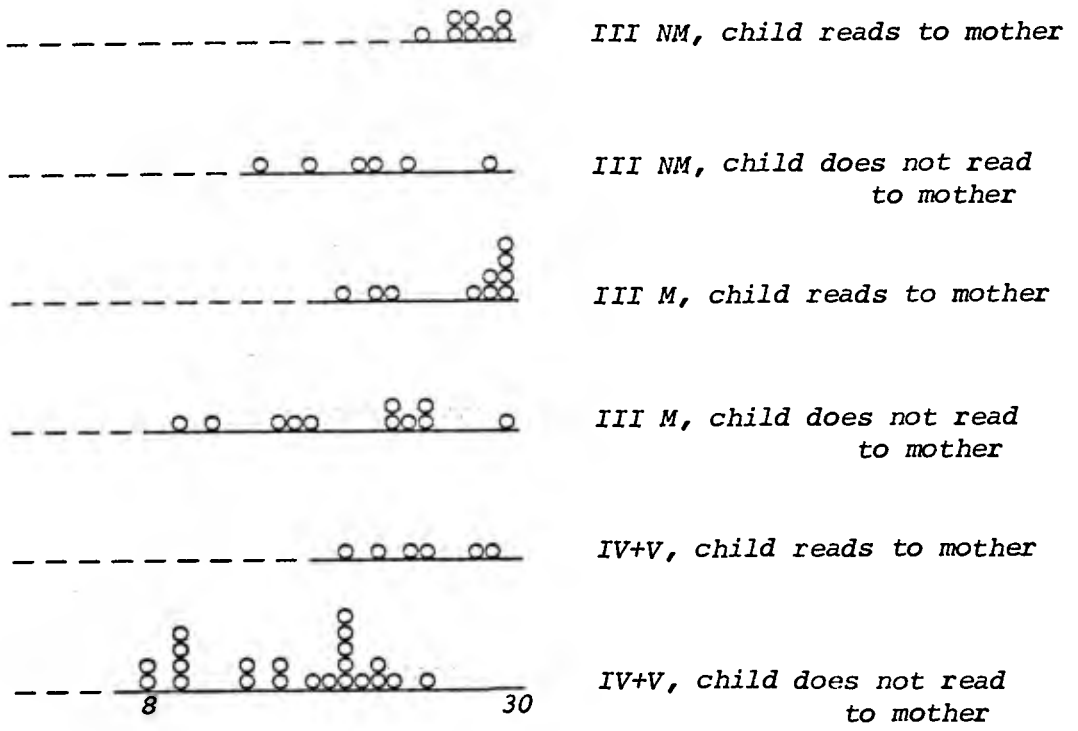


Figure 39. Two-way reading score histogram: social class x child reads to mother.

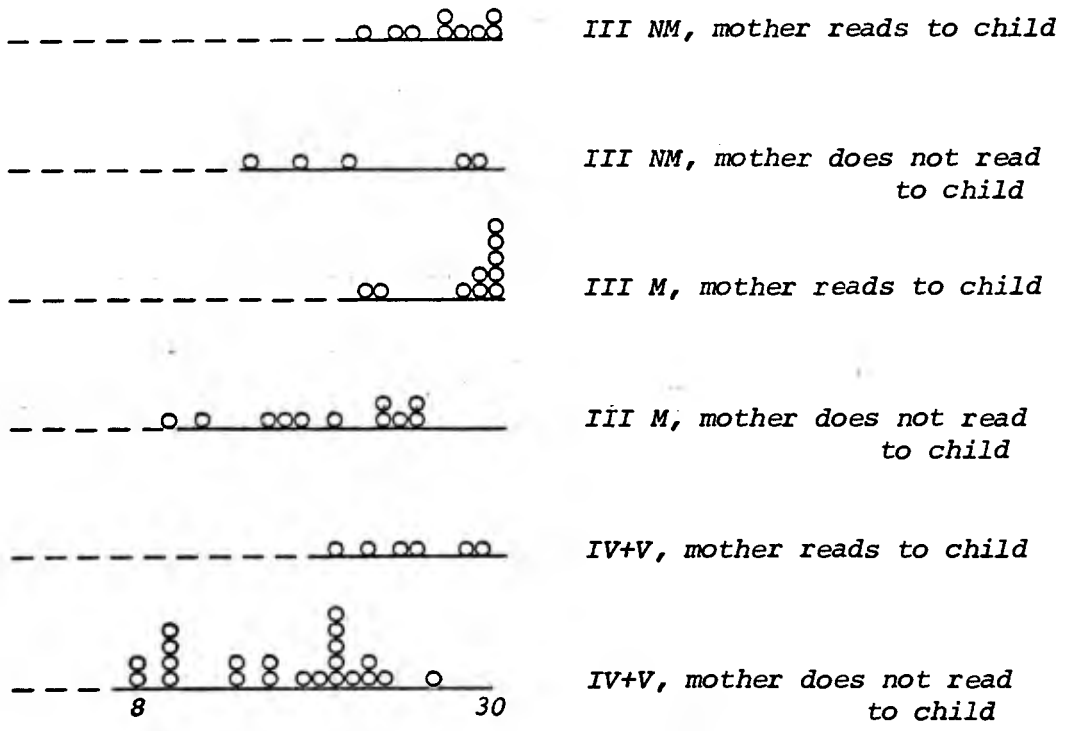


Figure 40. Two-way reading score histogram: social class x mother reads to child.

The most striking finding visually was that, within each social class group, the children who received help had higher reading scores. Nonetheless, within each 'help' category, there was evidence that a social class gradient persisted.

It had been planned to limit analysis of the pilot data to simple assessments such as this. However, the effect of the 'direct help' variable was considered large enough to be worth pusuing (i.e., unlikely to be the effect of chance,) while the social class data was not subject to bias insofar as the categories were defined before the study began. The analysis was, therefore, pursued, using analysis of variance techniques.

It was appreciated that the two measures of 'direct help' were, to a very large extent, making the same comparisons. The practice of running parallel analyses for the two was continued, however, because there was no good reason to look at one rather than the other, and it was possible that differences between the two might emerge as analyses proceeded. In fact, this was not to be the case, and in all the analyses performed, both variables yielded almost identical answers. Only the results from one series of runs, using the 'Child reads to mother' variable, are reported here; the details of the parallel series, using 'Mother reads to child,' are given in Appendix 3.

The first analysis carried out was a two-way Anova of class (3 levels) by 'CtoM' (2 levels,) with Southgate reading test score as the dependent variable. The result was a non-significant class by 'CtoM' interaction, a strong

'CtoM' effect, and a weaker but still significant class effect. The Anova table is given below.(Table 34.) A Multiple Classification Analysis was also carried out on the data, as shown, and revealed how the class effect was weakened by adjusting for 'CtoM'. Before adjustment, the difference in means on going from II NM to IV & V was of the order of 7 points on the reading scale. Afterwards, it was between 4 and 4½ points. As a very rough guide, these figures correspond to about 6 months and 3 months difference in reading age terms. Looking at the 'CtoM' factor, before adjustment for social class, the differerence between the means of the two groups was over 8 points: after adjustment, it was still over 7 points.

The analysis was then repeated, but with the addition of inventory score as a metric covariate. The effect of class having been diminished when the 'CtoM' factor was adjusted for, the suggestion now was that allowing for another important class-related variable would decrease the remaining class effect still further. This was indeed found to be the case, as is shown in Table 35. The 'CtoM" effect remained highly significant, but the class effect now fell well below the 0.05 level. (N.B. The sums of squares explained by the covariate cannot be compared with the others, as it is an unadjusted figure in a 'classic' Anova like this one: each main effect is assessed while controlling for covariates and all other factors, but nothing is controlled when assessing the influence of the covariate. In other words, its assigned contribution is the sum of its unique contribution, plus the 'areas' it has in common with the two

Table 34. Analysis of Variance: Reading score by CtoM x Class

```
* * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * *
            SGATE    SOUTHGATE READING TEST SCORE
         BY CTOM     CHILD READS TO MOTHER
            CLASS    SOCIAL CLASS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                    SUM OF                    MEAN          SIGNIF
SOURCE OF VARIATION                 SQUARES      DF           SQUARE     F  OF F

MAIN EFFECTS                       1232.889       3         410.963  17.791   .001
   CTOM                             684.306       1         684.306  29.624   .001
   CLASS                            195.580       2          97.790   4.233   .019

2-WAY INTERACTIONS                    5.280       2           2.640    .114   .892
   CTOM     CLASS                     5.280       2           2.640    .114   .892

EXPLAINED                          1238.169       5         247.634  10.720   .001

RESIDUAL                           1316.688      57          23.100

TOTAL                              2554.857      62          41.207
     63 CASES WERE PROCESSED.
      0 CASES (    0 PCT) WERE MISSING.

* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
            SGATE    SOUTHGATE READING TEST SCORE
         BY CTOM     CHILD READS TO MOTHER
            CLASS    SOCIAL CLASS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =    21.62

                                                                  ADJUSTED FOR
                                                 ADJUSTED FOR     INDEPENDENTS
                                    UNADJUSTED   INDEPENDENTS     + COVARIATES
VARIABLE + CATEGORY          N      DEVN  ETA     DEVN  BETA      DEVN  BETA

CTOM
    0 USED TO OR NEVER      39     -3.18         -2.72
    1 DOES STILL            24      5.17          4.43
                                          .64              .55

CLASS
    1 NON MANUAL            14      3.60          2.23
    2 SKILLED MANUAL        21      1.90          1.22
    3 SEMI AND UNSKILLED    28     -3.23         -2.03
                                          .46              .29

MULTIPLE R SQUARED                                .483
MULTIPLE R                                        .695
```

Table 35. Analysis of Variance: Reading score by CtoM x Class with Inventory score as covariate

```
* * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * *
            SGATE    SOUTHGATE READING TEST SCORE
         BY CTOM     CHILD READS TO MOTHER
            CLASS    SOCIAL CLASS
       WITH CRINVEN  CHILD REARING INVENTORY SCORE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                    SUM OF                    MEAN          SIGNIF
SOURCE OF VARIATION                 SQUARES      DF           SQUARE     F  OF F

COVARIATES                         1138.713       1        1138.713  60.111   .001
   CRINVEN                         1138.713       1        1138.713  60.111   .001

MAIN EFFECTS                        338.272       3         112.757   5.952   .001
   CTOM                             221.921       1         221.921  11.715   .001
   CLASS                             79.843       2          39.922   2.107   .131

2-WAY INTERACTIONS                   17.035       2           8.518    .450   .640
   CTOM     CLASS                    17.035       2           8.518    .450   .640

EXPLAINED                          1494.020       6         249.003  13.145   .001

RESIDUAL                           1060.837      56          18.944

TOTAL                              2554.857      62          41.207
     63 CASES WERE PROCESSED.
      0 CASES (    0 PCT) WERE MISSING.
```

main effects. However, whether the common ground is kept separate, or assigned as here to the covariate, does not affect the assessment of the unique contributions of the other variables, which is the point of interest here. Further discussion of this question is to be found in Chapter 3.)

For technical reasons, internal to the computer program package, it was not possible to perform Multiple Classification Analysis on the above design. Referring, therefore, just to the Anova table, it was concluded that part of the effect of social class on reading attainment in the present sample was the result of the differential distribution across classes of educationally favourable child-rearing practices.

Mothers in the lowest social group were particularly unlikely to follow favourable practices, but to the extent that they did, then their children's retardation in reading attainment was almost completely overcome.

Other social class differences on home environment indices

Leaving aside for the present the question of reading, social class comparisons were also made of a number of other home environment indices.

Crosstabulations were drawn up to show the incidence of the 'aspirations,' 'chat' and 'mother's own reading' variables across the three social class groups. (Tables 36 - 38.)

Table 36. Class by Aspirations

CLASS	ASP LOW (0)	ASP HIGH (1)	ROW TOTAL
1. NON MANUAL	3	11	14
	21.4	78.6	22.2
	11.5	29.7	
	4.8	17.5	
2. SKILLED MANUAL	8	13	21
	38.1	61.9	33.3
	30.8	35.1	
	12.7	20.6	
3. SEMI AND UNSKILL	15	13	28
	53.6	46.4	44.4
	57.7	35.1	
	23.8	20.6	
COLUMN TOTAL	26	37	63
	41.3	58.7	100.0

RAW CHI SQUARE = 4.10941 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .1281
CRAMER'S V = .25540

Table 37. Class by willingness to chat

CLASS	CHAT UNWILLING (0)	CHAT LIKES TO CHAT (1)	ROW TOTAL
1. NON MANUAL	4	10	14
	28.6	71.4	22.2
	9.8	45.5	
	6.3	15.9	
2. SKILLED MANUAL	15	6	21
	71.4	28.6	33.3
	36.6	27.3	
	23.8	9.5	
3. SEMI AND UNSKILL	22	6	28
	78.6	21.4	44.4
	53.7	27.3	
	34.9	9.5	
COLUMN TOTAL	41	22	63
	65.1	34.9	100.0

RAW CHI SQUARE = 10.82594 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .0045
CRAMER'S V = .41454

Table 38. Class by Mother's own reading

CLASS	MTOM DOES NOT READ (0)	MTOM READS BOOKS (1)	ROW TOTAL
1. NON MANUAL	9	5	14
	64.3	35.7	22.2
	18.8	33.3	
	14.3	7.9	
2. SKILLED MANUAL	14	7	21
	66.7	33.3	33.3
	29.2	46.7	
	22.2	11.1	
3. SEMI AND UNSKILL	25	3	28
	89.3	10.7	44.4
	52.1	20.0	
	39.7	4.8	
COLUMN TOTAL	48	15	63
	76.2	23.8	100.0

RAW CHI SQUARE = 4.79063 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .0911
CRAMER'S V = .27576

Direct and indirect measures of parental aspirations, and of parental reading habits (the 'reading model' provided) have been very widely used in educational research. It is, therefore, of interest to note that their distribution across the social class groups found in the present sample is not sufficiently biassed to reach statistical significance. The index derived from Bernstein's theories about language behaviour did, however, show a strongly class-linked incidence pattern.

School differences, home environment and reading attainment

The procedure adopted here was the same as for the social class comparisons.

Firstly, crosstabulations were drawn up of School times 'direct help given,' in order to determine if this useful practice was less common in one school catchment area than in the other. (Tables 39 & 40.)

Whatever the explanation of the attainment difference between the two schools, it was clearly not a result of a lower proportion of helpful mothers in one area than in the other.

The distribution of child-rearing inventory scores was also compared between the two schools, with an equally non-significant result. (t= 1.18 with 61 df. Not significant.)

Analyses of variance were performed, with school and 'direct help given' as the two factors, firstly in just the

Table 39. School by Mother reads to child

```
                MTOC
 COUNT  I
ROW PCT I USED TO  DOES        ROW
COL PCT I OR NEVER STILL       TOTAL
TOT PCT I      0I       1.I
SCHOOL  --------I--------I--------I
    1.  I     18  I     13  I     31
        I  58.1   I  41.9   I  49.2
        I  47.4   I  52.0   I
        I  28.6   I  20.6   I
       -I--------I--------I
    2.  I     20  I     12  I     32
        I  62.5   I  37.5   I  50.8
        I  52.6   I  48.0   I
        I  31.7   I  19.0   I
       -I--------I--------I
COLUMN       38        25        63
 TOTAL     60.3      39.7     100.0

CORRECTED CHI SQUARE =       .01045 WITH 1 DEGREE OF FREEDOM.  SIGNIFICANCE =    .9186
PHI =     .04532
```

Table 40. School by Child reads to mother

```
                CTOM
 COUNT  I
ROW PCT I USED TO  DOES        ROW
COL PCT I OR NEVER STILL       TOTAL
TOT PCT I      0I       1.I
SCHOOL  --------I--------I--------I
    1.  I     19  I     12  I     31
        I  61.3   I  38.7   I  49.2
        I  48.7   I  50.0   I
        I  30.2   I  19.0   I
       -I--------I--------I
    2.  I     20  I     12  I     32
        I  62.5   I  37.5   I  50.8
        I  51.3   I  50.0   I
        I  31.7   I  19.0   I
       -I--------I--------I
COLUMN       39        24        63
 TOTAL     61.9      38.1     100.0

CORRECTED CHI SQUARE =       .02580 WITH 1 DEGREE OF FREEDOM.  SIGNIFICANCE =    .8724
PHI =     .01245
```

Table 41. Analysis of Variance: Reading score by CtoM x School

```
* * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * *
              SGATE    SOUTHGATE READING TEST SCORE
           BY CTOM     CHILD READS TO MOTHER
              SCHOOL
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS	1252.592	2	626.296	29.518	.001
CTOM	1025.412	1	1025.412	48.329	.001
SCHOOL	215.283	1	215.283	10.147	.002
2-WAY INTERACTIONS	50.451	1	50.451	2.378	.128
CTOM SCHOOL	50.451	1	50.451	2.378	.128
EXPLAINED	1303.043	3	434.348	20.472	.001
RESIDUAL	1251.814	59	21.217		
TOTAL	2554.857	62	41.207		

63 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
              SGATE    SOUTHGATE READING TEST SCORE
           BY CTOM     CHILD READS TO MOTHER
              SCHOOL
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

GRAND MEAN = 21.62

VARIABLE + CATEGORY	N	UNADJUSTED DEV'N	UNADJUSTED ETA	ADJUSTED FOR INDEPENDENTS DEV'N	ADJUSTED FOR INDEPENDENTS BETA	ADJUSTED FOR INDEPENDENTS + COVARIATES DEV'N	ADJUSTED FOR INDEPENDENTS + COVARIATES BETA
CTOM							
0 USED TO OR NEVER	39	-3.18		-3.17			
1 DOES STILL	24	5.17		5.14			
			.64		.63		
SCHOOL							
1	31	1.93		1.88			
2	32	-1.87		-1.82			
			.30		.29		

MULTIPLE R SQUARED .490
MULTIPLE R .700

Table 42. Analysis of Variance: Reading score by CtoM x School with Inventory score as covariate

```
* * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * *
              SGATE    SOUTHGATE READING TEST SCORE
           BY CTOM     CHILD READS TO MOTHER
              SCHOOL
         WITH CRINVEN  CHILD REARING INVENTORY SCORE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
COVARIATES	1138.713	1	1138.713	74.253	.001
CRINVEN	1138.713	1	1138.713	74.253	.001
MAIN EFFECTS	430.626	2	215.313	14.040	.001
CTOM	273.865	1	273.865	17.858	.001
SCHOOL	172.197	1	172.197	11.229	.001
2-WAY INTERACTIONS	96.049	1	96.049	6.263	.015
CTOM SCHOOL	96.049	1	96.049	6.263	.015
EXPLAINED	1665.388	4	416.347	27.149	.001
RESIDUAL	889.470	58	15.336		
TOTAL	2554.857	62	41.207		

63 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

two-factor design, then with inventory score as a covariate. (Tables 41 & 42.)

The difference in reading attainment between the two schools remained highly significant in both analyses. In the second, there was also the suggestion of a 'school' by 'direct help' interaction.

The Multiple Classification Analysis which followed the Anova in the first design run confirmed that the main effects of 'school' and 'direct help' were virtually independent of each other. The shift in deviation scores for one factor when the other factor effect was controlled was only 0.01 units in both cases.

> (N.B. It is important not to confuse interaction effects and 'overlapping' main effects here. The former refers to the additional effect on the criterion of particular combinations of factor levels, i.e., it is information over and beyond that provided by the main effects; 'overlapping' main effects, on the other hand, refers to the partitioning of the main effects contribution itself, when, due to non-orthogonality, the main effects contributions cannot be assessed independently of each other. This distinction is discussed further in Chapter 3.)

The search for an explanation of the school effect was abandoned at this point. As was described earlier, Schools L and E differed in numerous ways, both in terms of internal characteristics, such as staffing and organisation, and external features of their catchment areas. Variables stemming from either source could have been responsible for the observed difference in reading standards between the two schools. The problem remained unresolved.

Differences between other demographic groups on the home environment indices

Since these analyses were only an offshoot of the main investigation, they were kept simple and brief. The three demographic variables selected as of most interest were sex, mother working, and family size. For the last two, it was wanted to know whether working mothers, and mothers of large families, could be demonstrated to have child-rearing practices which were relatively undemanding of their time and attention. Such an expected direction of difference could not always be specified so easily for the sex variable; however, any demonstrated difference in child-rearing practices between boys and girls would be of interest, since sex-role learning is currently a topic of popular concern.

Looking first at the 'mother working' and 'family size' variables, crosstabulations were drawn up for each in turn against the 'direct help' variables and 'chat.' (Tables 43 - 48.)Histograms were also plotted of the child-rearing inventory score, stratified by 'mother working,' and then by grouped family size. (Figures 41 and 42.)

No significant differences were revealed by the χ^2 analyses, and inspection of the histograms led to a similar conclusion for inventory score. (Suggestions of less favourable practices in full-time working mothers, and mothers of large families were detected, but the numbers were so small as to permit no conclusions to be drawn from these findings.)

Table 43. Mother working by Mother reads to child

MWORKING	MTOC: USED TO / NEVER	DOES STILL	ROW TOTAL
	0	1.0	
1. NOT WORKING	15	12	27
	55.6	44.4	42.9
	39.5	48.0	
	23.8	19.0	
2. PART TIME	16	9	25
	64.0	36.0	39.7
	42.1	36.0	
	25.4	14.3	
3. FULL TIME	7	4	11
	63.6	36.4	17.5
	18.4	16.0	
	11.1	6.3	
COLUMN TOTAL	38	25	63
	60.3	39.7	100.0

RAW CHI SQUARE = .44805 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .7993

Table 44. Mother working by Child reads to mother

MWORKING	CTOM: USED TO / NEVER	DOES STILL	ROW TOTAL
	0	1.0	
1. NOT WORKING	16	11	27
	59.3	40.7	42.9
	41.0	45.8	
	25.4	17.5	
2. PART TIME	14	11	25
	56.0	44.0	39.7
	35.9	45.8	
	22.2	17.5	
3. FULL TIME	9	2	11
	81.8	18.2	17.5
	23.1	8.3	
	14.3	3.2	
COLUMN TOTAL	39	24	63
	61.9	38.1	100.0

RAW CHI SQUARE = 2.29939 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .3167

Table 45. Mother working by willingness to chat

MWORKING	CHAT: UNWILLING / LIKES TO CHAT		ROW TOTAL
	0	1.0	
1. NOT WORKING	16	11	27
	59.3	40.7	42.9
	39.0	50.0	
	25.4	17.5	
2. PART TIME	16	9	25
	64.0	36.0	39.7
	39.0	40.9	
	25.4	14.3	
3. FULL TIME	9	2	11
	81.8	18.2	17.5
	22.0	9.1	
	14.3	3.2	
COLUMN TOTAL	41	22	63
	65.1	34.9	100.0

RAW CHI SQUARE = 1.77143 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .4124

Table 46. Family size by Mother reads to child

TOTALN	MTOC	USED TO OR NEVER	DOES STILL	ROW TOTAL
		0	1	
1;2.	COUNT	14	13	27
	ROW PCT	51.9	48.1	42.9
	COL PCT	36.8	52.0	
	TOT PCT	22.2	20.6	
3.	COUNT	15	6	21
	ROW PCT	71.4	28.6	33.3
	COL PCT	39.5	24.0	
	TOT PCT	23.8	9.5	
4+	COUNT	9	6	15
	ROW PCT	60.0	40.0	23.8
	COL PCT	23.7	24.0	
	TOT PCT	14.3	9.5	
COLUMN TOTAL		38	25	63
		60.3	39.7	100.0

RAW CHI SQUARE = 1.89221 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .3883

Table 47. Family size by Child reads to mother

TOTALN	CTOM	USED TO OR NEVER	DOES STILL	ROW TOTAL
		0	1	
1;2.	COUNT	15	12	27
	ROW PCT	55.6	44.4	42.9
	COL PCT	38.5	50.0	
	TOT PCT	23.8	19.0	
3.	COUNT	13	8	21
	ROW PCT	61.9	38.1	33.3
	COL PCT	33.3	33.3	
	TOT PCT	20.6	12.7	
4+	COUNT	11	4	15
	ROW PCT	73.3	26.7	23.8
	COL PCT	28.2	16.7	
	TOT PCT	17.5	6.3	
COLUMN TOTAL		39	24	63
		61.9	38.1	100.0

RAW CHI SQUARE = 1.29231 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .5241

Table 48. Family size by willingness to chat

TOTALN	CHAT	UNWILLING	LIKES TO CHAT	ROW TOTAL
		0	1	
1;2.	COUNT	16	11	27
	ROW PCT	59.3	40.7	42.9
	COL PCT	39.0	50.0	
	TOT PCT	25.4	17.5	
3.	COUNT	15	6	21
	ROW PCT	71.4	28.6	33.3
	COL PCT	36.6	27.3	
	TOT PCT	23.8	9.5	
4+	COUNT	10	5	15
	ROW PCT	66.7	33.3	23.8
	COL PCT	24.4	22.7	
	TOT PCT	15.9	7.9	
COLUMN TOTAL		41	22	63
		65.1	34.9	100.0

RAW CHI SQUARE = .79157 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .6731

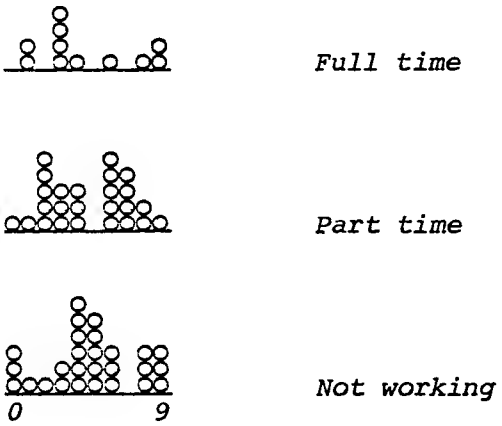


Figure 41. Child-rearing inventory score by mother working.

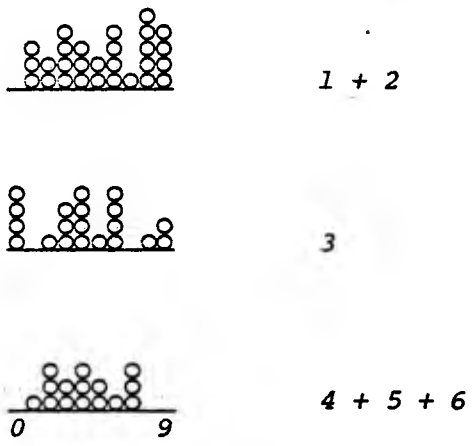


Figure 42. Child-rearing inventory score by grouped family size.

The child-rearing variables had all been shown to be important for school success. They also possessed face validity as indices of the time and trouble taken by a mother over her children's upbringing. It is, therefore, of interest to note that mothers of large families, and mothers who go out to work, are not less able to be 'good' mothers in these respects than women who stay at home, or limit the size of their families. It appears that if a woman wants to find time to spend on her child, then she will do so. Staying at home, or having a small family are no guarantee of 'good' child-rearing practices, while going out to work, or having a large family does not necessarily lead to poorer ones.

Sex differences in child-rearing practices

Crosstabulations were drawn up of the distributions across the two sexes of the 'direct help'variables, 'chat' and 'asp,' Tables 49-52 and a stratified histogram was plotted of inventory score. (Figure 43.)

On no variable was there a significant sex difference (although there was a suggestion of one on 'MtoC', mothers being somewhat less likely to read to boys than girls. Interestingly, the 'CtoM' variable did not show a similar trend.) Mothers are no more likely to chat to their daughters than to their sons, or to have higher aspirations for boys than girls - and so on.

Table 49. Sex by Aspirations

ASP

COUNT / ROW PCT / COL PCT / TOT PCT	LOW (0)	HIGH (1)	ROW TOTAL
SEX			
1. GIRLS	15	28	43
	34.9	65.1	68.3
	57.7	75.7	
	23.8	44.4	
2. BOYS	11	9	20
	55.0	45.0	31.7
	42.3	24.3	
	17.5	14.3	
COLUMN TOTAL	26	37	63
	41.3	58.7	100.0

CORRECTED CHI SQUARE = 1.52468
WITH 1 DEGREE OF FREEDOM.
SIGNIFICANCE = .2169

Table 50. Sex by willingness to chat

CHAT

COUNT / ROW PCT / COL PCT / TOT PCT	UNWILLING TO CHAT (0)	LIKES TO CHAT (1)	ROW TOTAL
SEX			
1. GIRLS	28	15	43
	65.1	34.9	68.3
	68.3	68.2	
	44.4	23.8	
2. BOYS	13	7	20
	65.0	35.0	31.7
	31.7	31.8	
	20.6	11.1	
COLUMN TOTAL	41	22	63
	65.1	34.9	100.0

CORRECTED CHI SQUARE = .07555
WITH 1 DEGREE OF FREEDOM.
SIGNIFICANCE = .7834

Table 51. Sex by Mother reads to child

MTOC

COUNT / ROW PCT / COL PCT / TOT PCT	USED TO DO OR NEVER (0)	STILL (1)	ROW TOTAL
SEX			
1. GIRLS	22	21	43
	51.2	48.8	68.3
	57.9	84.0	
	34.9	33.3	
2. BOYS	16	4	20
	80.0	20.0	31.7
	42.1	16.0	
	25.4	6.3	
COLUMN TOTAL	38	25	63
	60.3	39.7	100.0

CORRECTED CHI SQUARE = 3.61438
WITH 1 DEGREE OF FREEDOM.
SIGNIFICANCE = .0573

Table 52. Sex by Child reads to mother

CTOM

COUNT / ROW PCT / COL PCT / TOT PCT	USED TO DO OR NEVER (0)	STILL (1)	ROW TOTAL
SEX			
1. GIRLS	25	18	43
	58.1	41.9	68.3
	64.1	75.0	
	39.7	28.6	
2. BOYS	14	6	20
	70.0	30.0	31.7
	35.9	25.0	
	22.2	9.5	
COLUMN TOTAL	39	24	63
	61.9	38.1	100.0

CORRECTED CHI SQUARE = .38900
WITH 1 DEGREE OF FREEDOM.
SIGNIFICANCE = .5328

Girls (N = 43)

Boys (N = 20)

Figure 43. Inventory score by sex

It will be remembered that in this sample, there was also no difference in attainment between boys and girls. The two sets of findings are clearly compatible. Quite why sex differences in Dagenham are conspicuous by their absence remains an unanswered question.

The Pilot Study - Overview and Discussion

The main finding of the pilot study, and the one most easily lost sight of within a welter of detail, is that certain information about children's home backgrounds greatly aids understanding of individual differences in school attainment. This rule holds within a socially and materially homogenous area, as well as in a national sample, although the variables which provide the best discrimination amongst sample members may well differ in the two cases.

Demographic factors, such as indices of family size and circumstances, which are predictors of attainment in a national sample, are not important here. Sex differences are insignificant. Interestingly, social class differences persist: children in non-manual families read better than the children of skilled workers, who in turn read better than the children of semi- and unskilled workers.

To set against a large number of disadvantages, the small sample size of the present study had the positive aspect that it accentuated the crudity of demographic variables as indices of home environment. Demographic categories such as 'atypical family circumstances' were seen very clearly for what they are - a mixed bag of different sorts of people in a wide variety of circumstances. The 'atypical' families in Dagenham included both extremely disorganised people, and some of the most capable and determined women, who were 'going it alone.' It came as no surprise, therefore, when children from atypical families showed no uniform trend in attainment in

in either direction.

Similarly, the effect of family size depends on the sex, age and spacing of sibs. Two teenage sisters who play with a seven-year old boy and spend time with him are a very different N = 3 family from two brothers of 11 and 13 who are short of both time and patience.

The present study found no detrimental effects on child-rearing practices or on attainment of a mother going out to work. Again, if a closer look is taken at the women who go out to work in an area like Dagenham, it becomes clear that generalisations about them are bound to lead to inconclusive results. As a subjective impression, but a very strong one, it was not the careless, indifferent mothers who left home and family to go out to work, but rather the organised, competent ones who wanted to earn money to spend on 'extras' for the family. On the other hand, some of the mothers who stayed at home, particularly if they had no preschool child, were women who clearly found the effort of housekeeping too much for them, let alone the extra organisation required to go out to work.

Another variable widely regarded as being an important index of home environment is the 'cultural level' of the home: do the parents own books and do they themselves read? In the Dagenham sample, such information proved disappointing as indicative of either high attainment on behalf of the child, or favourable child-rearing practices on behalf of the mother.

Presumably, the attraction to teachers of 'cultural level of the home' as a predictor of reading success is

that it fits in very well with their overall notion of a 'good home', i.e., one which provides an atmosphere supportive of what they, the teachers, are trying to do. Parents are not encouraged to do anything directly constructive themselves, but merely to provide this support, this back-up service, to convince the child that school is important and teachers know best.

Similar reasoning underlies the wide acceptance of 'parental aspirations' as a home background variable related to attainment. Parents with high aspirations will convey to their child their eagerness that he should work hard in school. His efforts are encouraged and appreciated, but these are just other expressions of the same supportive, but non-executive role.

Bernstein's theory concerning the importance of language can be seen as fitting this framework also. Children who are deprived in their homes of the right sort of language are unable to profit maximally from the experience of school: once again, the home background (a very telling choice of word) is seen as responsible for not giving teachers the sort of child they need as raw material on which to practise their craft.

The variables used in this study which were derived from these last-mentioned ideas - 'Asp' and 'Chat' - were both found to be related to school achievement as the 'background' theorists would be predict. The interpretation which can be placed on these findings is discussed below.

As well as testing some well-established ideas, the study also sought new characterisations of the home environment which might be related to school achievement. It was

soon apparent that no subtle influences would emerge as a result of this quest, because the enquiries made were often found to be inappropriate to the sample, in that they did not discriminate amongst its members. While it may be interesting to know that fathers who play non-physical games with their children are very rare creatures in Dagenham, it is not a useful finding in the present context. The fact that hardly anybody within a sample does a certain thing is of no use in trying to understand variation within that sample on a criterion measure. It was realised that much more descriptive groundwork about family life in a working-class community was needed before a full search for educational influences could be profitably resumed.

As far as many child-rearing practices were concerned, applying a middle class model to the range of behaviour expected within the sample had proved a mistake. That mistake was repeated in a different context also. It has long been the fashion to condemn the influence of television on the young. Hours spent in mindless TV watching could otherwise be spent in reading, or so the argument goes. However, even the limited data collected in the present study suggest that this argument is only tenable at all if its implicit assumption is a valid one, i.e., that the alternative to TV watching is indeed reading. Put another way, if TV is the alternative, not to a more educationally useful activity like reading, but instead to a much less useful one like wandering the streets, then it may not be such a social evil after all. In Dagenham, while most children went out to play as soon as they possibly could,

a few preferred to stay in and watch children's television. The children who watched late at night often sat with their parents to do so. In a number of cases, as far as could be judged, the programmes provided a focus for conversation, or at least stimulated a few question and answer exchanges, which might otherwise not have taken place.

Once again then, it is suggested that the application of ideas of what constitutes a good or bad influence on a child's educational progress may be seriously misguided, if it is undertaken without first examining implicit assumptions about the availability of alternatives.

Despite these mistakes, it was possible to establish from the pilot data that a number of aspects of mothers' child-rearing behaviour did vary amongst sample members, and further, that some of these aspects were related to the school attainment of the sample children.

This is a very important finding. The way in which a mother behaves towards her child - her approach to child-rearing - has consequences for that child even when he moves from home to school environment, and leaves his mother's physical presence behind. For five years before he began school, and for much of his time afterwards, he is firmly under her influence. The school child he has become is in very large measure the product of her efforts.

The problem now takes on a new perspective. Having established that a number of aspects of home environment show a statistical association with attainment, it is next necessary to discover how far these aspects are inter-related, and if so, whether each has an independent contribution to make to the prediction of attainment.

The situation is somewhat paradoxical. For the purposes of interpretation at this level of analysis, it is essential to look at cases where the mother shows some favourable characteristics but not others. However, for the purposes of face validity, the various indices of child-rearing should be correlated. Mothers who give thought to the upbringing of their children in some contexts,but not others,run counter to 'common-sense' expectations.

In considering the actual data, common-sense predictions were borne out to a large extent. Favourable scores on certain variables were associated with similar scores on others - mothers who chatted tended to have high aspirations, and also to give help, for example. The result was that these measures all picked out a common core of the same people, highlighting the question of what really did matter for high attainment and what did not. Similarly, the groups formed on these variables were found to differ in score on the 'inventory,' which sampled other aspects of child-rearing behaviour. Undoubtedly too, there would be many other influences at work - the inventory was in no sense a measure of home environment, and many important aspects must have been excluded through lack of insight. Further, the influence of relatives outside the nuclear family was not considered at all, while the role of sibs was examined only very sketchily. Peer group influences were not considered either. It is probable that at least some of these variables exert effects which are confounded with those already studied.

All that could be done in the way of disentanglement

was to look at the study variables, and see which emerged as the most plausible predictors of reading, and which as the concomitants, using as criteria both statistical tests, and appeal to common sense. The conclusions were then regarded in the light of the possible confounding effects considered above, and plausibility again invoked to decide that serious errors in interpretation were highly unlikely.

Returning to the study variables and their inter-relationships, it was important to distinguish clearly between the two sides of the correlational coin. Firstly, variables were inter-correlated, as common sense would dictate, but secondly, there were a large minority of discrepancies - women whose score on a certain variable was not at all what would be expected from their scores on others. For example, there were women rated unfavourably on aspirations or willingness to chat, but who took the trouble to give their children help with reading at home.

Invaluable from the point of view of interpretation - which will be returned to below - these women were also noteworthy precisely because they confounded common-sense expectations. Perhaps 'middle class expectations' would be a better term here, for it is a middle class model which proposes that aspirations concerning length of schooling can be equated with concern about progress in the basic subjects at primary school level. Similarly with language behaviour: a mother may fail to see the value of conversing with her child, but still be totally committed to ensuring he learns to read and write. If anything, working class mothers seem more preoccupied with the importance of acquiring the 'three Rs' than do middle class

mothers - to the extent of criticising child-centred methods of education for not teaching children properly. Not being able to read, it appears, is something very definitely to be ashamed of. The common mistake in this context is to assume that just because many working class men and women never read anything more than a tabloid newspaper, or the instructions on the side of a can, they somehow do not value the reading skills they possess, however humble those skills may be in terms of 'reading age' criteria.

Giving one's child help at home with reading is a very positive act, and also a very positive indication of 'interest in education.' Furthermore, it is strongly associated with high performance in reading. The reason why so little is known about this aspect of home environment can only be open to conjecture. As an index of 'interest,' it has presumably slipped through the research net because class teachers may be unaware of its occurrence. It is not necessarily related to other indices of interest, such as aspirations for education beyond sixteen, or visiting the school to discuss the child. As a positive act, it has presumably gone unnoticed because positive acts do not figure in the 'supportive background' version of what constitutes a good home.

The argument may be taken further. No attempt seems to have been made in the past to test alternative explanations of the 'supportive home' effect, one of which is that women who provide the said support are also more likely to intervene actively in the educational process, and it is this latter variable which is the crucial one for high

attainment. Specifically, it is being suggested here that, to the extent that measures of support and measures of active intervention do not overlap, then it is the intervention which matters for reading achievement.

The results of analyses which separated out the contributions of aspirations and help, and of chat and help, accentuated the emerging importance of direct help with reading as the most crucial factor in predicting reading attainment. Mothers who had only low aspirations for their children in terms of school leaving age were relatively unlikely to give help at home, but to the extent that they did, then their children were successful readers. On the other hand, stated aspirations for education beyond 16 was no guarantee that a mother would take action to further those ambitions. Indeed, some of the women who were scored as having high aspirations would have been more accurately described as being passively hopeful - if their child were to stay on, then that would bring great pleasure, but in the meantime, a fatalistic stance was adopted, and nothing was done.

The giving of help emerged as the most influential concomitant of high aspirations. The same was true of the 'chat' variable (i.e., the one derived from Bernstein's theories.) Mothers who enjoyed chatting were more likely to give help than those who did not. Once this fact was controlled for, the effect of 'chat' was found to be greatly reduced. Bernstein's research stopped at the stage of finding a significant 'chat' effect, and apparently, no thought was given to possible alternative explanations. Since the object of his team's research was to find empir-

ical evidence for the validity of the language theories, this jumping to conclusions was not perhaps surprising. Only in retrospect does it appear to have been over-hasty.

When data analysis in the present study reached the stage of looking for reasons behind social class differences, the importance of the direct help variable emerged again. Social class groups were found to differ in the incidence of this and other child-rearing behaviours, and when these differences were taken into account in the prediction of reading attainment, the social class gradient was much reduced. In particular, social class IV and V mothers were very unlikely to give help with reading at home, but to the extent that they did, for whatever reason, then their children were found to be above-average readers. Since the indices of child-rearing practices used in this study were very crude, and sampled only a fraction of the mother's behaviour, it is very encouraging that they account for a substantial proportion of the between-class differences in attainment in the study sample. This finding clearly needs further testing.

Having used variation in child-rearing practices as a possible explanation for social class differences, the same procedures were applied to the difference in attainment between the two sample schools. In this case, however, the school effect persisted, and could not be attributed to variation in the distribution of the home variables. Not having adequate information on the differences between the two schools, their discrepant attainments had to remain unexplained.

At the end of the pilot study, three needs were apparent:

1. To test those ideas about significant influences on reading attainment, which had emerged as a result of the pilot.

2. To refine some of the indices used, following distinctions which arose in the pilot, but which could not be incorporated in it. The difference between the two types of direct help was considered to be of particular interest and importance here.

3. To introduce IQ as a predictor of reading ability, and to compare it in predictive power with the home environment indices.

These three broad aims underlay the planning of the next study in the series, which is described in the chapter that follows.

CHAPTER THREE

THE FIRST JUNIOR SCHOOL STUDY

Introduction

One of the chief purposes of the pilot study had been to develop hypotheses about the aspects of the home environment which were relevant for school attainment. The need was now to test these hypotheses on new data. At the same time, it was planned to refine some of the ideas used, in the light of knowledge gained from the pilot, and also to introduce a few new variables. In all cases, it was possible in advance to formulate specific hypotheses about the role of a particular variable, so the design of the study was entirely closed-ended, even if some of the variables were being introduced for the first time.

The study then, was to be one of finding answers to specified questions - quite a different task from that of the pilot investigation.

To become more specific, it was desired to find out if the pattern of significant and non-significant home background variables revealed by the pilot would hold up on new data. In terms of the child-rearing variables, this meant getting information on all the nine inventory items, on direct help, on the 'reading model' provided by the

mother, on her aspirations, and on her language behaviour. (It was considered important to check the pilot findings of non-significant as well as significant effects, i.e., if a supposedly 'established' predictor had only shown a weak relationship to performance in the pilot, it was considered that this finding should be checked, as well as the findings relating to 'new' predictors.)

Modifications were to be made to the assessment procedures for two of the most controversial variables - 'direct help,' and the language usage or 'chat' variable. In the former case, it was desired to obtain more precise information as to who was reading to whom, how often, and so on. It was suspected that the pilot information was inexact on the question of who did what, since the distinction had not emerged as important at the time of interviewing for the pilot, and if a mother said she did one thing regularly, she was not questioned so closely about the other. Further, it had not been possible in the pilot to establish if one type of help had more effect than the other on the development of reading skill. This was considered an important distinction to make because of its implications for practice, so clarification of the issue was to be one of the main concerns of the new study.

In the pilot data, when the effect of giving help had been taken into account, the influence of the 'chat' variable was much diminished. One obvious criticism of this analysis is that the measure of language behaviour used was a very crude one. For both the 'chat' and 'direct' help variables, mothers were reporting their own behaviour, but it could be

argued with some justification that it is easier to make a self-assessment on the giving of help than on the style of language behaviour current between mother and child. In order to see if this objection had any validity, a better assessment of maternal language style was required. It was decided that the best plan was to use the two measures developed and employed by Bernstein's own research team for the same purpose (Brandis and Henderson 70.) The first of these two measures was a scale designed to assess a mother's willingness to chat - i.e., the aspect of language use already included in the pilot - and the second, her willingness to take trouble in answering her children's more awkward questions. Both scales were reported to be significantly related to both reading and IQ measures. (Brandis and Henderson 70, Brandis 74 - pers. comm.)

Administering these two measures would add significantly to the time taken to carry out an interview, since both involved asking the mother a series of questions, not just one or two. However, it was considered that the time spent would be worthwhile. Using the Bernstein team's own measures would resolve this unexpectedly complex issue more satisfactorily than would be possible any other way, since the charge could always then be laid that short-cut versions of these measures were not adequate to their task.

As far as the ground to be covered in the interview was concerned, only two completely new pieces of information were wanted, both minor demographic items - mother's educational level, and, if she was at work, her social class. What was of interest was whether or not these

variables were related to the mother's aspirations and child-rearing practices.

IQ. home background and attainment

The other completely new dimension introduced into the present study was the collection of IQ data on the sample children. In Chapter 1, when the initial plans for the present research were being described, the intention was announced of departing from previous research practice by putting IQ scores to a variety of uses in the analyses of the study's attainment data. Previous studies, it was pointed out, had either used IQ in its traditional role as predictor of achievement, or had treated it as a dependent variable, itself to be predicted from knowledge of environmental factors. No study, however, had explored in full the inter-relationships of IQ, home background and reading performance: such an exploration was to be an important part of the present research.

Some of the theoretical considerations relating to the role of IQ in the analysis of performance data were raised in Chapter 1. These issues are discussed in more detail in this section, while the practical details of the planning of the present study are given in the section to follow.

Conventionally, analysis of group differences in attainment proceed by using IQ score as a covariate, i.e., they calculate the relationship between IQ and the attainment measure employed, then 'adjust' the attainment scores to take account of this effect. The rationale for doing this is as follows: if a correlation exists within the data so

that high IQ is associated with high attainment, and the groups to be compared differ in mean IQ, then any group difference found might merely be a reflection of this IQ advantage. Using IQ as a covariate means, in effect, working out the group difference expected on the basis of the IQ advantage, then seeing if the observed difference is in fact significantly greater than that, as opposed to greater than zero. If it is, then the analysis is interpreted as demonstrating a genuine factor effect. (It is not being suggested that in any numerical procedure for covariance analysis, this is what is being done; rather that this is a meaningful way of describing the questions which the analysis is answering.)

The procedure described above depends for its validity on two related assumptions, one underlying the nature of the relationship between the IQ and attainment measures, the other underlying the relationship between IQ and the factor, or grouping, variable. Taking the second of these first; the group difference in IQ is treated as a difference in the 'input' to the current situation. Each subject brings his IQ with him as an attribute when he enters the series or collection of circumstances which comprise the grouping variable. Assessment of output must take account of any group difference in input. It is worth adding here that assessments of input, i.e., IQ are usually measured concurrently with output, i.e. attainment, on the assumption that the IQ measurement has not changed over time.

If the model is envisaged in these sequential terms, severe limitations are placed on the sort of relationship between IQ and grouping variable which the model can accommodate. It is possible that IQ could influence group

entered - either directly, as in streaming by ability in schools, for example, or indirectly, (for any one individual), by 'natural' selection for high ability in the upper social classes. It is not possible on this model for causality to work the other way, i.e., for the grouping variable to influence IQ.

The sequential model in its 'environmentalist' version does not demand that IQ be considered as a fixed attribute of a person, and the 'malleability' of IQ under certain circumstances may be conceded. What cannot, however, be conceded, if the model is to be preserved intact, is that the grouping variable under consideration in the design, or any variable associated with it, is amongst those environmental factors which can affect IQ. If streaming by ability, or being brought up in one social class rather than another, can influence tested IQ, then this must have consequences when the attainments of each group are being evaluated in terms of what is expected of them.

It must be stressed that it is not necessary to take up an extreme environmentalist position in order to defend this argument. In no sense is it being suggested that score on an IQ test is purely a reflection of environmental influences. Even if the influence of 'grouping variable' on IQ were quite small, it would still be important because of the possible nature of its consequences in real-life situations. In the two examples given above, whatever the validity of the original assignment to groups, if the effect of belonging to Stream 'C' or Social Class V is to depress IQ, then use of a conventional 'ability predicts attainment' model will underestimate the level of achievement which the

children could be expected to reach. This argument holds whether the prediction is an intuitive or a statistical one. Further, adjusting for IQ in these circumstances will reduce the observed magnitude of any factor effect, since an artificially high proportion of, e.g., social class differences in attainment, is now 'expected' on the basis of social class differences in IQ, with a correspondingly reduced proportion of the variance being attributable to social class acting on attainment.

In practice, this is important, because it affects interpretation of social class differences in the direction of justifying the status quo. If low social class children, or deprived children, or those in any other similar category, are expected to show low attainments on the basis of an artificially depressed IQ, then this will affect their teachers' expectations of them, their curriculum, the allocation of remedial teaching resources, and so on.

It has been suggested by some researchers (e.g., Yule 67) that it is "desirable and necessary" to include intelligence as well as chronological age when establishing a child's degree of reading retardation. This position is defended in a later paper (Rutter and Yule 75) specifically not on the grounds of belief in innate intelligence, but rather because it is a useful procedure in practice. Unfortunately, no attention is given to the possibilities for bias suggested above. This issue is returned to in greater detail in later sections of this report.

The above discussion would apply to a combination of any predictor with any criterion variable. The two measures could be of entirely different things, and need not even be taken on the same person. If, on the other hand, both

covariate and criterion are psychological measures taken from one individual, the additional problem arises of the possibility of overlap between the two. This is where the second of the two assumptions underlying the use of IQ as a covariate becomes relevant, i.e., in the relationship between the IQ and attainment measures.

The problem is best illustrated by an example taken from another area of research - that of 'reading readiness' testing. After extensive investigation, it was found that the 'readiness' tests which best predicted beginning reading ability were the ones which contained the strongest elements of reading, as opposed to auditory perception, left-right discrimination, or any other motor, perceptual or memory task thought fit to be included. (Chazan 70.) As in this example, the more similar are the behaviours and skills tapped by a predictor to those tapped by the criterion, then the more may statistical prediction be improved. Clearly, in the example given, this is at the expense of any gain in real information and understanding.

In the case of IQ as predictor, it is now widely recognised that an IQ score is an attainment score of a kind, in that answering test questions requires reasoning skills which have been more or less extended and refined during a child's development (Floud and Halsey 58, Vernon 60, Halsey 61, Wall et al 62, CACE 63, Douglas 64, Rutter and Yule 75.)

It is not the extent of overlap between IQ testing and reading testing which is of concern here. Rather it is the implications of any overlap at all for the validity of using IQ as a covariate in an analysis of reading achievement

scores. The greater the common area of skills tapped by the two types of test, the higher will be the correlation between IQ and attainment, and hence the more 'adjusting for IQ' will influence the analysis.

To repeat, this argument against the traditional use of IQ as a covariate in analyses of attainment (other uses of IQ to achieve similar ends are included here too, e.g., screening, or selecting a band of children with a particular range of IQ scores) has been pursued at some length not because it held in a particularly strong form, but because the conventions it is questioning are so well-established and pervasive. What is being suggested is not a wholesale rejection of the usefulness of IQ as a covariate, but rather recognition that there is a great need to test the assumptions underlying the use of the IQ variable in such contexts.

For the purposes of the present study, it was planned to obtain IQ data on the sample children, and to use that data in a variety of analyses. Standard covariance analyses would be performed, but so would calculations treating IQ as the dependent variable, when looking at the influence of home environment factors. Yet other calculations would assess the contribution of IQ to prediction of achievement, over and beyond that already provided by home background information, and the relative predictive power of the different variables in this context would be assessed. The predictive power of IQ in a predominantly working class sample was of particular interest here. Returning to one of the original questions underlying the whole study, namely, what is it that matters for high achievement in a working class area, it will be seen that collecting IQ data contributes to

the answering of this question. Do the highest achieving children have the highest IQs, or the highest social class, or is it some aspect of the mother's behaviour which counts the most? These were the questions which the present study was designed to answer.

In this context, it was decided that the best possible IQ measure should be employed in the present study. The use of short 'reasoning' tests, such as that used by Douglas (1964), would lay the study open to the criticism that such measures are inadequate, and that detailed individual tests are necessary to gain a true assessment of a child's ability. It was concluded that if the present study was to contribute to the IQ debate in any serious way, only the best IQ test would suffice: the decision was therefore taken to use the Wechsler Intelligence Scale for Children (the WISC) as the study's IQ measure.

Planning the first junior school study

In terms of overall design, there was little change from the pilot to the present study. Children were not to be selected for inclusion in the study on educational or home background criteria, extreme groups were not to be sought, and correlational, not comparative, statistical techniques were to be used to analyse the data.

In more practical terms, however, there were a number of important differences. The first of these was made necessary by time constraints. The study presently being described was to be carried out in the Autumn term beginning the 1974-75 academic year. The pilot study had been carried out in the preceding June and July, on children in

their final term at infants' school. A decision had to be made therefore as to which cohort of children was to be used in the Autumn study. The choice was between the same cohort as in the pilot, now four months older, and the succeeding cohort, who were eight months younger. The former was chosen as best reflecting one of the original aims of the study, which was to look at children who had just completed the first phase of their formal education. In practical terms, of course, they were just embarking on the first term of their junior school careers.

A sample somewhat larger than that of the pilot was wanted, and efforts were to be made to include equal numbers of boys and girls.

Information from three sources was wanted for each child; reading test score, IQ and home background information. The Southgate was retained as the measure of reading, because it was expected that, in a working class area, discrimination amongst the poorer performers would not be possible with a more advanced test. WISC IQ was adopted as the IQ measure, for the reason given earlier, i.e., that although a WISC requires time and skill to administer, it has the advantage, for interpretative purposes, of being the best IQ assessment available. The home background information which was sought was less extensive in some respects than that in the pilot, but more detailed and specific in others.

The same demographic information was wanted as before, partly to check previous findings, and partly because it was easy information to obtain during the 'warm up' to an interview. Additions here were questions asked on the type

of work performed by working mothers, and the mothers' own educational level. In the latter case a low incidence of any form of education beyond the statutory minimum was expected, so it was decided to find out also if the mothers who had left school as soon as possible had ever regretted it.

The same information about aspirations was wanted as in the pilot. Information about reading models was now to be restricted to asking about the mother, not both parents, while information about help with reading was to be sought in more detail. In particular, it was planned to make a more careful distinction between the sort of help in which the child took an active role, i.e., read himself, and the sort in which he listened while someone else did the reading.

The items from the inventory of child-rearing practices were all to be covered in the new interview schedule also.

The important difference between the first and second interview schedules was that, in the latter, all the non-demographic questions were treated as 'closed-ended,' i.e., the 'natural divisions' into which the pilot data had fallen were now specified in advance as coding categories. This had important practical implications, in that it was no longer necessary to record verbatim all that the mother said, for subsequent coding. Instead, an interview form was devised, in which each question was followed by a list of the specified alternative responses, which could be scored directly as the interview proceeded. In most cases, only the dichotomies eventually used for coding in the pilot were specified, i.e., not the original number of

categories formed by 'natural divisions'. For the direct help variables, all the pilot coding categories were retained, because the variables had emerged as so important in the pilot analysis, while for four other variables, a more detailed breakdown was retained for no better reason than that it was intuitively easier during an interview to code them that way.

The items and their coding decided upon, they were shuffled around and rearranged in a plausible order, moving as before from 'factual' demographic questions towards the potentially more value-laden attitude and behaviour items.

Not so far considered are the Bernstein scales. As described previously, Bernstein's team had developed a number of scales tapping different aspects of a mother's language and behaviour, two of which they had shown to be related to children's reading and IQ scores. These two scales assessed willingness to chat, and willingness to answer awkward questions, in each case by setting up a number of specific contextsor questions, and seeking the mother's response from a list of specified alternatives. These two scales were added on to the end of the interview schedule, just as they were, using the same introductory remarks as did the original researchers. Further details of these scales, including a description of scoring procedures, are given in the section on coding of the interview data.(See pages 255-57.)

The completed interview form for this study consisted of a four-page booklet, moving from demographic information on the front page, though to Bernstein scales at the back. A copy is reproduced in Appendix 4.

The Sample and Data Collection

The sample schools

About a hundred first-year junior children were required. This was too large a number for all to be obtained from one school, so the problem arose of how many schools to use. Two schools would mean an unavoidable confounding of school and catchment area effects, as took place in the pilot. A large number of schools with a small number of children taken from each was not feasible for practical reasons. A compromise was decided upon, and the Local Education Authority was asked for four junior schools. The reasoning behind this was as follows: a difference between two schools could be the product of any of the internal or external factors on which the schools differed. With four schools, differences and similarities could be more readily disentangled, and related to performance differences across the four. To do this, information would be needed on aspects of school organisation which might be relevant, and on the school's approach to reading teaching in particular. In an ideal situation, schools would be chosen to reflect certain organisational differences and similarities, and hence to permit the most useful comparisons to be made. In practice, it was not possible to make such detailed requests of the Local Education Authority, and it was known that the study would have to be carried out in whichever schools were made available. For this reason, information on the schools' practices was not sought at the stage of selecting a sample, and was in fact left until much later in the study. However, for the purposes of limiting variation in school practice to what

could later be assessed by this method, it was decided to take only those children from a junior school who had attended a particular infants' school. The easiest way of ensuring a sufficient supply of such children was to ask the Local Education Authority for one-site 'Junior and Infants' schools, so this was the only restriction, apart from catchment area, placed on the Local Education Authority's choice. The authority had already been asked before the pilot to supply only schools with uniformly working class catchment areas. They were now asked to think as far as possible in terms of schools in similar areas of one particular housing estate.

The four schools which were eventually suggested were all on the main estate (i.e., not on its fringes, as the pilot schools had been) in almost a straight north to south line. The two furthest schools were about a mile and a half apart. All had remarkably similar catchment areas, i.e., road after road of two-storey houses, with the occasional block of two-storey flats. All houses had gardens. Shops and other facilities were confined to clusters at the junctions of main roads. Here were no buildings older than 1920, or newer than 1935. (Peter Wilmott's book on Dagenham, 1963, provides a good description of the striking uniformity of this part of the estate.) There appeared to be no property in any of the four catchment areas (which, incidentally, bordered on each other) which was not owned by the Local Authority. The impression, later confirmed from the school rolls, was that the overwhelming majority of the council's tenants were white and working class. As in the pilot study, the material standard of the property was very

high, and overcrowding most unlikely: these impressions were also confirmed later in the study.

As with the catchment areas, the physical differences between the schools were insignificant when compared to their similarities. All, to borrow Wilmott's description, were "squat and solid in pre-war council style, with outside lavatories, asphalt playgrounds, and wire fencing."

The school heads were approached about participating in the study, and all willingly agreed to co-operate. As in the pilot, the method used by the Local Education Authority to select these heads was not known. It was certainly not a process of random selection, so the possibities of bias and non-representativeness which were present in the pilot were unavoidably present in this study also.

In terms of organisation, all four schools were, as requested, one site 'junior and infants.' All, however, divided up their first year intakes in different ways. These internal organisational features of the schools are summarized in Table 53 below.

The same sort of sample in terms of age and attainment composition was wanted from each school. Unlike the pilot study, it was not possible to achieve this by investigating all the children on each school roll, since the numbers involved were now too large. In no school had a truly random allocation procedure been used, so working with just one class was not possible in any of the four. To produce a final sample size of about 100, it was decided that 30 names should be chosen from each school, to allow for refusals, failure to make contact, and so on. Fifteen boys and fifteen girls were therefore wanted from each school.

TABLE 53

Organisational features of the sample schools

Size of intake

	School V	T	S	P
No on first year roll	78	51	65	38
Boys	41	35	32	19
Girls	37	16	33	19
No of classes into which first years were admitted	3	3	3	2

Method of allocating children to classes

School V: Infant Head gave children Neale reading test - used in allocation. Each class received a mixture of good and poor readers. Just first years in first year classes.

School T: School as a whole had six classes - 3 of 3rd and 4th year children, 3 of 1st and 2nd year children. No systematic method of allocating intake to particular classes.

School S: First year streamed on basis of age. The five eldest children went into a 2nd year class, then one class formed with March-Sept. birthdays, and the other with Oct.-March.

School P: Streaming by ability. Six boys and two girls from 1st year in special mixed-age class for poor performers. All rest in one class.

Eventually, it was decided to follow the same procedure for each school, which was simply to pool all the boys' or girls' names from the first year intake, and draw 15 of them out of a hat. Before this selection took place, however, the lists of names were screened, and children excluded who were immigrants, children of immigrants, or who had not attended the on-site infants' school, in order to eliminate these factors as sources of variation within the sample. The numbers excluded from each school roll under these headings are as follows :

TABLE 54

Children excluded from sample

	School			
	V	T	S	P
Immigrants or children of immigrants	2	1	1	0
Children from other infants' schools	1	0	1	0

In school T, exclusion of one girl left only 15 on the roll, so all were used in the study. In all other cases, the random selection procedure was used to produce lists of 15 names.

In the pilot, there had been two types of data collection to be arranged, reading testing and home interviews. These were to be repeated, and a third, IQ testing, was to be added.

The reading testing

Continuing the practice adopted in the pilot, administration of the reading tests was carried out by the schools, and the tests sent to the researcher for marking. The testing was carried out at the schools' convenience, at some time within a specified period. It was jointly decided that all the first year children in each school should be tested, rather than just the sample 30, because it would avoid problems of 'singling out' certain children, and because the extra information was wanted by the Headteachers. The Southgate test was familiar to only one of the four Heads, so full consultations

were held before the tests were administered. No problems were reported. If a sample child was absent on the day of testing, special efforts were made to test him on a later occasion, so all but two of the 120 were eventually tested. One missing child was subsequently discovered to have moved away from the district.

The home interviews

One of the most important practical consequences of changing the design of the interview schedule from open- to close-ended was that it was now possible to estimate more exactly how long an interview would take. Most interviews, it was decided, would take between 20 and 30 minutes. This greater predictability, together with the actual shortening of the interview itself, permitted more efficient arrangements to be made for obtaining the required 100 interviews. During the pilot interviewing, a great deal of time had been lost by trying to arrange interview appointments in advance. At the very best, this meant that two calls were necessary at each house. In practice, mothers who were not in the habit of appointment-making tended to forget them and go out. Presumably also, mothers who were undecided about co-operating had time to decide it was too much bother, and to make sure they were out at the appointed time.

For the present study, a new tactic was adopted. Letters were sent out from the schools, as before, introducing the interviewer, and saying she would call and ask for the mother's help. When she called, which was never later than the following week, the mothers were asked, then and there, if they had twenty minutes to spare, and would they

mind being interviewed. Appointments were only arranged if necessary, i.e., if the mother was genuinely interested and co-operative, but the first visit was at an inconvenient time. The alternative tactic used in these circumstances was to arrange to call back at an unspecified later date, but at a time established as convenient, e.g., if the mother said she was always in between four and six in the afternoon, it was arranged that the interviewer would return some day that week, at the appropriate time.

Introductory letters were only taken home by the 30 sample children in each school. It was envisaged that out of the 30, 26 or 27 mothers would agree to participate and be successfully interviewed. Somewhat surprisingly, all the mothers contacted were willing to participate, and nearly all the interviews were carried out on the first visit. A few mothers preferred a later time, but all were successfully interviewed on the second visit. As a result of this unexpectedly high co-operation rate, interviewing was stopped in a particular school area when 26 or 27 interviews had been completed. In each area, some mothers had been out when their homes were first visited. Repeat visits were made until the required number of interviews had been completed, beyond which it was considered that the return for effort would not be worthwhile. As in the pilot, the time of day varied at which any particular home was visited. Repeat visits were made as far as possible at different times, but again this varied from house to house. As a result, the 3 or 4 homes in any area which were not contacted could have been 'selected' as such on a purely chance basis.

Certainly, it was not a case of systematic visiting selecting out those mothers who were usually absent from home. Further, it was known that the reading scores of children from these homes would be available to check for sampling bias manifesting itself in that form.

As a result of cutting off the 'tail end' of the interviewing in each area, each school's quota was completed in two weeks. Altogether, therefore, the interviewing for this study took eight weeks, in October-December 1974. 107 women were interviewed in all.

In only a handful of cases was a problem experienced regarding the response categories in the questionnaire. In all these cases, very full notes were made at the time of the qualifications made by the mother to her answer. The item was then brought up again later in the interview, and probes made until a satisfactory decision could be made as to which side of the borderline in question the mother leant towards.

The IQ testing

As interviewing proceeded, the names of children whose mothers had been contacted were furnished to a team of trainee educational psychologists. Two or three of these recruits visited the schools on one or two days a week, and worked their way down this list of names, administering a full WISC IQ test to children on the list who were present in school on the days they visited. Repeat visits to the schools to catch absentees were not feasible, so the eventual sample size for whom reading, interview and IQ data were available was 101.

The second reading testing

At this stage, the original proposals for data collection had all been carried out. A problem arose, however, which necessitated the extension of the reading testing aspect of the investigation into the Spring Term. Anticipating the Results section of this report, it was found from inspecting the histogram of the Southgate data that the test had not really been an appropriate one for the sample. In the pilot, while the distribution of scores had been markedly skewed, only about one fifth of the sample had scored in the NCDS 'good reader' category, i.e., 28 or more correct responses out of 30. In the present sample, (N=223 children for whom Southgate scores were available,) almost a third fell into this group, and the overall distribution was J-shaped. Further details are given in the next chapter of the limitations this data would have imposed on analysis procedures, but for the present, it is sufficient to report that the Southgate data was judged inadequate for the purposes of the study, and arrangements had to be made to collect new assessments of reading ability.

Advice was sought from the National Foundation for Educational Research as to choice of another reading test, and their recommendation was the NFER's own 'Reading Test A,' which was a comparatively new test, only standardised in 1972. The age range quoted for the test was 6:09 to 8:09, and it was calculated that Spring Term testing of the present sample would result in an age span of 7:05 to 8:05. The disadvantage of using this test was that it had not been

used previously in any large scale surveys, so that it would not be possible to make the sort of external comparisons which had been performed with the Southgate data in the pilot. However, the NFER's opinion was accepted that no alternative group test existed for the age range and type of sample involved, and arrangements were made with the Dagenham schools to have the children re-tested on the NFER 'A'.

In the NFER's words, the test is one of the 'simple sentence completion type,' consisting of 38 items, graded in difficulty. Practice items are provided, but the test proper is self-timed, with no specified time limit. Further details of the test, administration procedures and so on, are given in Appendix 5.

The second round of reading testing took place in February 1975. The tests were administered by the schools, after the usual briefing session, and were handed over to the researcher for marking. On this occasion, the schools tested only as many extra children as was convenient for them, but made great efforts to ensure that all children in the sample were tested by giving the test to absentees from the group session as soon as possible after their return to school. Despite these efforts, however, one child was lost from the sample as a result of repeated refusals to co-operate in the testing procedure. Her refusal seemed to be on grounds other than inability, since her class teacher reported that her reading skills were not markedly below average for her age, and certainly above the 'floor' of the test. It was known from the interviews that the child was under great stress at home (in care of grandmother

while mother was in hospital with leukaemia,) so it was decided that this was sufficient reason for excluding her from the sample.

The final sample size in this study, for whom complete interview, reading and IQ data were available was - fortuitously - exactly 100.

Coding of the Data

The completed sample.

As has been reported, interviews were obtained with all the women who were contacted in each area - 107 in all. This 100% co-operation rate came as a surprise to head-teachers and researcher alike, all of whom expected a certain percentage of refusals in an area such as this. The 107 mothers came from an original randomly chosen list of 120, and bias in selection of this 107 was not considered to be significant. The psychologists were able to test all but six of their children in the time they had available, and one more was lost at the stage of the second reading testing.

A problem arose in the pilot of women being interviewed who were not in charge of the child every day of the week, and who did not always know what happened to him when he was not with them. No similar circumstances arose in the present study, so no cases were lost from the sample for this reason. The unusually high number of such cases found in the pilot was attributed to the distinctive characteristics of one of the areas involved, a matter which was discussed in detail at the time.

Extensive information was available on each of the 100 children in the final sample. Table 55 below summarizes the areas covered.

/Table 55 ...

TABLE 55

Summary of information available on final sample

Factors in home

Demographic	Child-rearing
Social class	Aspirations
Total family size	Reading model
No. older sibs	Mother reads to child
No. younger sibs	Child reads to mother
Family circumstances	Child-rearing inventory (at present in form of separate items)
Mother working	Bernstein 'Chat' scale
Mother's social class	Bernstein 'Awkward questions' scale
Mother's education	

Measures on child

	Test scores
Sex	Southgate reading
Age	NFER 'A' reading
School	WISC IQ (with 10 subtest scores)

The analysis of all this information was a lengthy procedure, which has been reflected in the report that follows.

Unlike in the pilot study, in the present study, it was possible to be scientifically fastidious and complete the coding of the home background information before the reading tests were marked. The IQ tests were being administered while the interview coding was taking place, but the results were not made known to the researcher until the coding had been completed.

(A) Coding of the interview data

Demographic information: All the items included here, save the two on fathers' and mothers' social class, had been coded in their final form at the time of the interviews, using the same categories as in the pilot. The

question about mother's education, not present in the pilot, was given in advance the specified alternative responses,

Left as soon as could/Left but regret it/Anything beyond minimum; and had been coded as such during the interviews.

When the information obtained on occupations had been coded in terms of social class, the processing of this part of the data was complete. All the coded information from the interview protocols was then transferred directly onto computer data sheets, for subsequent card-punching.

Child-rearing data: The response categories developed in the pilot had been used as specified alternative responses in the present study, i.e., coding of responses for these items had taken place during the interviews. As described, some items had been provided with only two alternative response categories: others had more, primarily for the sake of ease of recording in most cases. For all items, however, it was intended that the response categories should ultimately be coded according to the system used in the pilot for data anlysis purposes.

In the case of items comprising the 'Child-rearing Inventory,' seven only had a two-way coding, so the remaining two had to have a similar final form to enable an overall score to be calculated. The data from these two items was, therefore, subjected to a collapsing of categories according to the plan worked out in the pilot, until dichotomies were formed. All the items which constituted the child-rearing inventory were then gathered together, and a score for each case obtained by ascertaining how many of the nine items had been answered favourably.

The questions about aspirations, modelling and the two kinds of help had also been multiply coded. Although the distribution of responses across the various categories was of interest at a descriptive level, a simpler coding system was wanted for data analysis purposes. Once again, therefore, the scheme for collapsing categories which had been developed in the pilot was employed to give these items dichotomous codings.

For all the above variables, the presumed educationally favourable response was coded '1' and the less favourable category '0'. These codings were then transferred onto computer data sheets as before.

Bernstein Scales:- These two scales had been administered in the exact form used by Bernstein's team in their research on achievement. In the case of the 'Chat' scale, this was the same version as had been described in a published paper (Brandis and Henderson 1970,) together with full instructions for its coding. The 'Awkward questions' index had, however, been modified between the 1970 publication and later research by the Bernstein team, so instructions for its administration and coding had to be sought directly from the researchers concerned. (Brandis 1974 - personal communication.)

In the final form of both scales, mothers are asked questions about a particular aspect of their language behaviour across a number of different contexts, in each case being given a number of possible responses to choose from. For the 'Chat' scale, what is sought is the mother's tendency to chat in a number of different physical circumstances - shopping, at meal times, and so on. This tendency

is assessed for each context on a four-point scale, assuming equal intervals between the ordered categories, and an overall scale score is obtained by simple summation, all seven items being given equal weight.

In concrete terms, mothers who stopped their child chattering in a particular context scored 0, those who told him to wait scored 1, talking to him quickly scored 2, and chatting with him scored 3. Seven items gave a scale with a maximum value of 21, and a minimum of 0.

For the 'Awkward questions' scale, the different contexts were different question which the child might ask, and to which the mother's responses were sought. Six alternative responses were presented to the mother, from which she was to choose what she would be most likely to do in each case. The alternatives were:

(a) Make up something until he's older.

(b) Tell him to ask Daddy.

(c) Try and change the subject.

(d) Take the opportunity to discuss the matter with him.

(e) Tell him he's not old enough to understand.

(f) Give him a brief answer and see if he's satisfied.

Eight different 'awkward questions' were presented. (This was the major modification from the 1970 version of the scale, when mothers were just asked to say whether they 'never,' 'sometimes' or 'often' used a particular response stratagem.) Following Brandis' instructions, responses (d) and (f) were taken to indicate a mother's disposition to answer awkward questions, while the other four responses were taken to indicate her disposition not to answer them. According to Brandis, a composite scale

requires responses (d) and (f) to be scored in a direction opposite to the remaining items, and further, that since response (d) is much stronger in content than response (f), it should receive twice the weighting of the latter.

All items were to be given equal weight, with, in each case, response (d) scoring +2, response (f) scoring +1, and all other responses scoring -1. Unfortunately, this system produces a scale with a range of scores from -8 to +16. For ease of arithmetic, therefore, 10 points were added to each total produced by this method, yielding a new range of +2 to +26. Such a procedure makes no difference to any of the usual statistical analyses, including correlation and regression analyses, and parametric analyses of variance: this is because at most, parametric statistics require interval scaling of measures, not ratio scaling (i.e., a meaningful zero point), and it is only the latter aspect of the Bernstein scales which has been tampered with here.

Each case had now received a coding between 0 and 21 for the 'Chat' scale, and 2 and 26 for the 'Awkward questions' scale. These codings were transferred to computer data sheets as before.

(B) The reading data

The procedure for marking the Southgate reading tests was exactly as in the Pilot study. Each child obtained a score in the range 0 to 30, and this figure was added to his file on the computer coding forms.

As was described in the 'Planning' section, it became apparent, even before all the Southgate forms had been marked, that the test was failing to discriminate amongst a large

proportion of the sample, so a second round of reading testing was arranged,using the NFER 'A'. This test produces a different type of final score from the Southgate, the latter yielding a raw score convertible only into reading age terms, while the raw score from the former may be converted into an age-corrected standardised score. Using this standardisation procedure, each child's performance is assessed by comparison with a sample of children of exactly the same age. The end-product is a reading score given in units very like those conventionally used for IQ, with mean 100 and standard deviation 15.

The above procedure was followed for the sample data, and an NFER reading score added to each child's file. The range of scores encountered was from 70, the floor of the test, to 133.

(C) The IQ data

Onto each child's file were added not only the calculated Verbal, Performance and Full Scale IQ's, but also the scores of the 10 constituent subtests. This information was taken directly from the WISC score sheets, which the testers had filled in.

All the information on each child's file was then transferred to punched cards for computer analysis. The same package programs as in the Pilot were employed, and will not therefore be dsecribed further here.

Descriptive Statistics

In the pilot study, a great deal of time was spent in extracting descriptive information about the sample in order to improve general understanding and familiarity with the population being studied. Such detailed description was, however, considered incidental to the main purpose of the present analysis, which was to investigate more thoroughly the relationship of certain home variables to school achievement, and if possible to disentangle certain inter-relationships amongst the predictors so established. For this reason, only a brief summary of the descriptive analysis of the data is given here. Routine cross-tabulations were performed, histograms plotted, and comparisons made with the Pilot and with national figures, but the results of these procedures have largely been consigned to Appendix 6.

(A) The interview data

The distribution of the categoric variables were as shown in Tables 56 & 57 below. For the 'Child-rearing' variables, since the original classification of responses had been more detailed than the dichotomy used for analysis purposes, both original and final classifications have been given. For all these variables, the collapsing of categories followed the scheme developed in the pilot study, and described in detail in Appendix 1.

Considering first the demographic information, there are a number of points to be made. Firstly, while the sample remained strongly working class, there was a shift in the distribution of occupational groups within that category. Compared to the Pilot, there were fewer semi- and unskilled

workers and more skilled workers in the present sample, a shift which probably reflects the somewhat different characteristics of the areas being studied. Further, since the methods of analysis to be used in the present study were more sophisticated, it was considered worthwhile to retain distinctions in the data as long as possible, rather than merge categories together as was done in the pilot. The example in question here is the retention of a 'no male head of household' category in the social class distribution, rather than including these cases in the lowest social group as is commonly done.

The distributions of the family size, family circumstances and mother working variables were unremarkable, and very similar to those in the pilot. A marked drop in the proportion of 'atypical' families had been expected, but was not observed, although subjective impression suggested a shift from 'disorganised atypical' to 'capable and determined atypical' which again probably reflected area housing characteristics.

The two new demographic variables provided unexpected insight into the predictability of life experiences for women in an area like Dagenham. Out of 100 women, only four had had any sort of education beyond the legal minimum. As an explanation of within-sample differences, therefore, mother's educational level was clearly a failure. The extra question on this topic proved a better discriminator, since 28 more women admitted that in retrospect, they regretted having left school when they did. This still left 68 women for whom school had been such an unattractive part of their lives that they had been, and remained, relieved and pleased to have escaped it as soon as they possibly could.

Table 56

First junior school study: demographic information
(N=100)

Social Class	IIINM	10
	IIIM	50
	IV & V	27
	No male head of household	13
Total family size	1 or 2	39
	3	32
	4+	29
No.older sibs	0	35
	1	34
	2+	31
No.younger sibs	0	46
	1	36
	2 or 3	18
Family circumstances	'Normal'	86
	'Atypical'	14
Mother working	Not working	44
	Part-time	38
	Full-time	18
Mother's social class	IIINM	28
	IIIM	4
	IV or V	59
	Never worked	9
Mother's education	Anything beyond minimum	4
	Left but regretted it	28
	Left as soon as could	68
Sex	Girls	48
	Boys	52
School	V	24
	T	26
	S	25
	P	25

For the question about mother's social class, information was sought on previous periods of employment if the mother was not working at the time of the interviews. Of the women who had worked at some time - 91 in all - 59 had had only semi- or unskilled occupations, mainly factory assembly work in the numerous local light industries. Only four had skilled jobs, such as hairdressing, for which training had been required. (The comparable figures for men were 27 and 50 respectively.) Of the 28 women whose occupations were classified as non-manual, only 11 had had clerical jobs, the rest working mainly as shop assistants.

Although only 9 women had never had any form of paid employment, 44 were not working at the time of the interviews.

Moving to the child-rearing variables, it must be said immediately that the detailed subdivision of responses given in Table 57 must be accepted only with caution. For example, on the 'Help' variables, mothers were not always questioned in detail to establish which category they fell into - if they replied that they were not still giving regular help, this was only followed up with unsystematic probes for extra information, until the response could be assigned to one of the categories developed in the pilot. Distinguishing mothers who maintained that they gave regular help from the rest created no problems, but subdivisions within 'the rest' were less satisfactorily defined, and much less to be relied upon. The same was true of the other two items - mothers who maintained that they were keen readers themselves were easily distinguishable from all the rest, as were mothers who expressed a desire on their part that their child should stay on at school after 16 years of age.

Table 57

First junior school study: 'child-rearing' variables (N=100)

Aspirations for child staying at school beyond 16			
	Yes - if child wants to	66	
	Wouldn't mind	33)	34
	Want him to leave	1)	
Mother's own reading			
	Reads a lot of books	33	
	No time	5)	
	Magazine or paper	42)	67
	Prefers TV	20)	
Mother reading to child			
	Regularly still	21	
	Have done in past, on some occasion	56)	
	Never have	19)	79
	Do now, didn't before	4)	
Child reading to mother			
	Regularly still	37)	
	Used to: child prefers to read on own	)	47
	now	10)	
	If brings book home, but not often	26)	
	Have done in past	7)	53
	Never have	15)	
	Do now, didn't before	5)	

Returning to the Help variables, two more points remain to be made. Firstly, a new response category was found to be necessary for both variables, to represent those mothers who had only decided to give their child extra help with reading as a response to markedly low performance by the child. Great care was taken during the interviews to establish that this really had been the case by further questioning the mothers involved about their previous practices. All five told basically the same story, which was that they had given their child very occasional help in the infants, or not given any help at all, and then had been very dismayed at his performance as reported by the infants teacher at open day. Purely in response to this,

they had begun to help him at home, but felt aggrieved that 'teachers nowadays can't do their job properly.' Putting these women into the category of 'regular help given' seemed quite unjustified, but their exclusion raised the question of whether others who had received the favourable coding had not been misclassified for this reason. Subjectively, the number who could possible fall into this category was very small - no more than 5 or 6 - since most of the confessed regular help givers spontaneously went on to give information about their previous practices which confirmed their original classification. When the collapsing of categories took place, the 5 identified late helpers were merged with all the other non-regular help-givers.

The second point which must be made about category assignment on these variables refers to the group of mothers in the opposite predicament, i.e., mothers whose offers of help with reading were rejected by their children because they could now read quite adequately on their own. Whenever this situation arose during interviewing, the mother was closely questioned to establish three points: that she had in the past given regular help with reading; that she was still willing to give help; but that her child declined her offers and preferred to read on his own. If all three points were answered affirmatively, then the mother was placed in the category of "Used to help - child prefers to read on own now." Following the procedure adopted in the pilot, when coding categories were combined for analysis purposes, this category was merged with 'help regularly still.' (The justification for this procedure was discussed on page 123 in the account of the pilot analysis.)

The caution that has been recommended in accepting the detailed sub-classifications in the present data applies equally to the pilot, if not more so, since the categories were developed as well as used there. As a result, comparisons between the two must be taken as no more than suggestive of possible underlying trends. Nonetheless, one particular pattern of change seemed worthy of attention. The proportion of mothers who received 'favourable' codings on the aspirations, mother's own reading and 'child reads to mother' variables was higher in each case in the present study than in the pilot, whereas the proportion who were coded as regularly reading to their children decreased. It could be speculated that area or sample differences were responsible for the upward shifts, but if so, then that same explanation becomes very unlikely for the downward shift.

Two other differences between the samples in the two studies were the age of the children and the stage of primary education reached - final year infants or first year juniors. It was possible, therefore, that a genuine change in practices underlay these figures, i.e., that when children enter the juniors, mothers are still prepared to listen to them read at home, but less likely to do the reading aloud themselves. Weight was added to this suggestion when the subdivisions within the 'no help' group were examined, and it was found that the biggest category by far was the ' have helped in past,' which had gained in size relative to the pilot. The implications of changes in

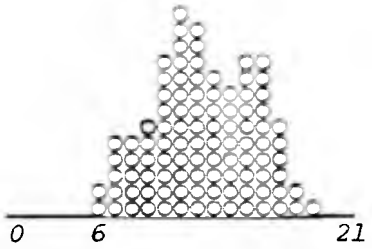
practice, if indeed they take place, are discussed later when the influence of the two types of help on performance is examined.

Descriptive information remains to be reported on three more variables from the interview data - the two Bernstein scales, and the 'Child-rearing Inventory' from the pilot. Since it was desired to use these variables in parametric data analysis, it was necessary to ensure that their distributions did not deviate too far from normality. The histograms are given in Figures 44 - 46 below. As will be seen, all three variables discriminated satisfactorily amongst members of the sample, and all three had distributions which were sufficiently normal to fulfil the assumptions underlying parametric statistical tests. In the pilot sample, the mean Inventory score had been 4.63 (N=63): in the present sample it was 4.03 (N=100). The two standard deviations were 2.64 and 1.98 respectively. Published studies using the Bernstein scales have not reported the measures' distribution characteristics, so no comparisons are possible for these variables.

Inter-relationship of demographic and child-rearing variables

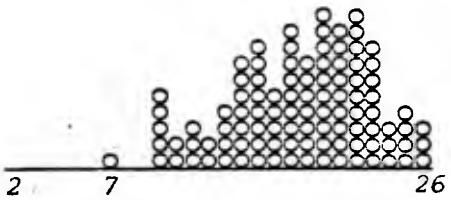
Routine investigations were carried out of the inter-relationship of the demographic and child-rearing variables. The results are reported in detail in Appendix 6 and only a summary of points of interest is given below.

1. There was a suggestion of a sex effect on some child-rearing variables, but not on others. On Inventory score, and the 'Chat' and 'Awkward questions' scales, mothers of girls scored slightly higher than the mothers



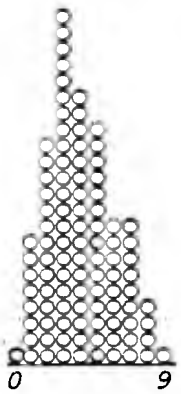
N = 100
Mean = 12.24
SD = 3.31

Figure 44. Distribution of scores on the 'Chat' scale.



N = 100
Mean = 18.52
SD = 4.31

Figure 45. Distribution of scores on the 'Awkward Questions' scale.



N = 100
Mean = 4.03
SD = 1.98

Figure 46. Distribution of scores on the 'Child-rearing Inventory'.

of boys. (Values of F significant at .06, .06 and .04 respectively.)

2. Family size was not related to any of the child-rearing variables.
3. The social classes did not differ significantly in their distributions of the variables 'aspirations,' 'mother's own reading,' the two sorts of help, 'Chat' or 'Awkward questions.' There was a significant overall F-value for class differences in Inventory score, but when the group was eliminated which had no male head of household, this difference disappeared.
4. Unusual family circumstances were not associated with any of the child-rearing variables except the Inventory, mothers in unusual circumstances tending to have lower Inventory scores. (F-value significant at .003.) The group selected as unusual on this variable is, with one addition, the same group as that excluded from the second stage of the class analysis given in (3) above.
5. Mother working was not significantly related to any of the child-rearing variables.
6. Mother's social class was weakly associated with listening to her child read, and rather more strongly with mother's own reading. (χ^2 values significant at .06 and .02 respectively.)
7. When mothers who had received anything beyond a minimum education were grouped with those who regretted their lack of one, and their child-rearing methods compared with the others, they were found to be more likely to have high aspirations for their children, to read to them and to listen to them read. (χ^2 values significant

at .004 and .05 and .006 respectively.)

8. There were no school effects on any of the child-rearing variables.

Inter-relationship of child-rearing variables

Once again, details of these analyses are to be found in Appendix 6, and the following list is only a summary of the main points.

1. Mothers with high aspirations were significantly more likely to have a high Inventory score and to listen to their children read. (Significance levels .013 and .002 respectively.) High aspirations were not, however, associated with the 'Chat' or 'Awkward questions' variables, with providing a good reading model, or with mother reading to child.
2. Mothers who read for their own interest were not characterised by any particularly favourable child-rearing practices, with one exception - they were more prepared to answer awkward questions. (Significance level .0002).
3. Mothers who scored highly on the Child-rearing Inventory also tended to chat to their children, to answer their questions, to read to them, and to listen to them read. (Significance level .001 in all four cases.)
4. The two measures of mothers' language behaviour were correlated, but not markedly so - their separate correlations with the Inventory score being in each case of the same order of magnitude.

	Awkward Questions	Inventory
Chat	0.36	0.35
Inventory	0.38	

(Significance level of all three coefficients is .001)

5. The two types of help with reading were also associated, but again not markedly so. This comparison is of particular interest because of the possibility raised earlier that mothers' practices may change when their children enter junior school. The full cross-tabulation is therefore given in Table 58.

TABLE 58

'Child reads to mother' by 'Mother reads to child'

		Mother reads to child: No	Yes	
Child reads to Mother	No	48	5	53
	Yes	31	16	47
		79	21	100

The phi coefficient calculated from this table is .30, by comparison with 0.77 from the pilot data. (Crosstabulation given on page 184). In the pilot, there had been a strong tendency for mothers who gave one sort of help to give the other also. In the present study, this symmetrical association has broken down in two ways. Firstly, a large number of children (over a third of the sample) are getting one sort of help without the other, and secondly, the help they are getting is predominantly of the 'child reads to mother' variety. Following on from the argument developed earlier,

it may be conjectured that some of the mothers who used to give both sorts of help have now ceased doing some of the reading themselves, and instead leave it all to the child. This argument is returned to in the analysis of the reading data.

6. Scoring highly on the language behaviour scales was much more strongly associated with listening to children read than with reading to them. The four point-biserial correlation coefficients are as follows :

	Mother reads to child	Child reads to mother
Chat	0.02 (.41)	0.31 (.001)
Awkward questions	0.22 (.015)	0.35 (.001)

(The significance level of each coefficient is given in brackets)

It was discovered in the pilot that overlap of predictors is an important consideration when interpreting any analysis relating home background variables to school achievement. The techniques chosen to analyse the data in the present study were selected with this in mind, so that, for example, attempts could be made to separate out the influences on achievement of language behaviour and giving direct help. These analyses are reported in a later section.

B. <u>The reading data</u>

The distribution of the Southgate scores was as shown in Figure 47 below. Since such a large proportion of the sample was effectively reaching the ceiling of the test, it was clearly not the right instrument to measure reading ability in this population. Further, its J-shaped distribution meant that it could not be used as the criterion variable

in regression analysis - the statistical procedure chosen to analyse the data. One of the assumptions underlying the use of this technique is that the criterion variable should be approximately normally distributed.

The distribution of the second set of reading data obtained, that from the NFER test 'A', is given in Figure 48 and is clearly much more satisfactory than that of the Southgate on both counts given above. No child reached the ceiling of the test, and only one hit the floor. The distribution was approximately normal, with a mean of 94.2 and a standard deviation of 11.46.

Comparison of the distribution of reading scores in the sample of 100 with that from the total age group tested.

Attempts had been made in the four schools to test all first-year children on the Southgate, reading scores being eventually obtained for 223 out of the 232 children on roll at the start of the survey. However, when the need for a second round of reading testing was announced, the schools expressed the preference that it be limited to the sample children only. This wish was respected, so it is necessary to return to the Southgate data in order to compare the sample children with the age group as a whole.

Figure 49 below shows the distributions of the grouped Southgate scores, first for the total group, and then for the selected sample of 100.

As will be recalled, the eventual sample of 100 was derived from a randomly selected list of 120 names, only 119 of whom remained resident in the neighbourhood for the duration of the data collection. Southgate scores were not obtained on two of the 120, so they form no part of the

Figure 47. Distribution of Southgate raw scores.

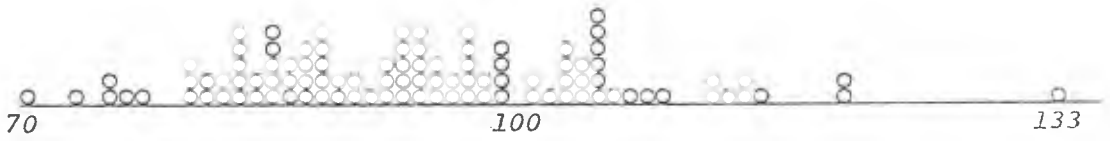
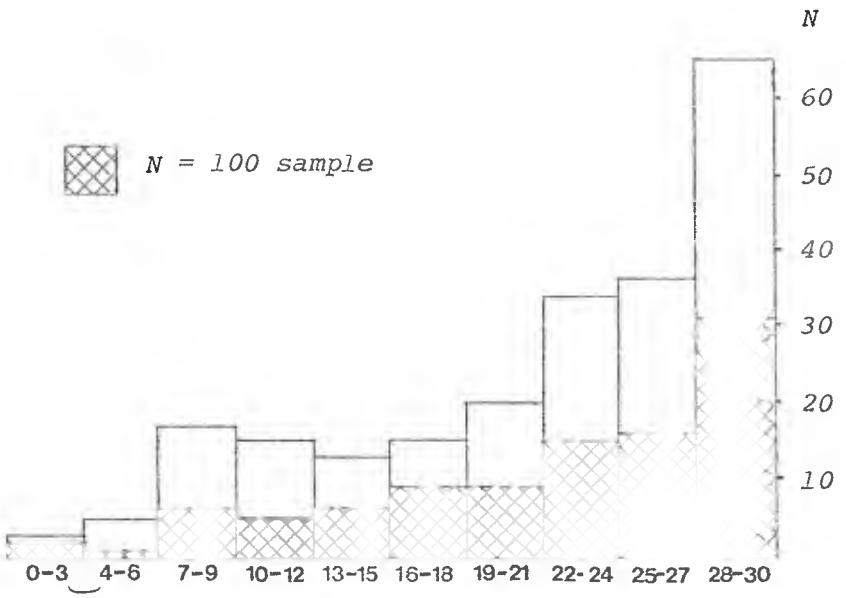


Figure 48. Distribution of NFER 'A' standardised scores.



	0-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	
Total tested	8	17	15	13	15	20	34	36	65		223
Study sample	3	6	5	6	9	9	15	16	31		100
Non-sample	5	11	10	7	6	11	19	20	34		123
Listed but not contacted		1		1	1	1	3	2	2		
Interviewed but not WISC-ed	1	1	1			2	1				
No NFER reading test score				1							

Figure 49. Distributions of grouped Southgate scores in the total reading sample (N=223) and the final study sample.(N=100)

present comparison. Of the 118 names left, 11 were not contacted by the interviewer, six more were interviewed but not IQ tested, and one could not be tested on the NFER. The distributions of these various lost cases are given at the bottom of Figure 49. From inspection, the sample of 100 appeared to reflect very well the spread of reading standards in the age group as a whole. A χ^2 test performed on the grouped data from the N = 100 distribution and the N = (223-100)= 123 distribution confirmed this impression. (Bottom two cells collapsed, i.e. df = 8.χ^2= 3.23. Not significant.) As for the 'lost cases,' the numbers were too small for any firm conclusions to be reached about bias, but this also meant that they were too small for possible distortions to have any serious effect on the representativ-ness of the final sample.

Comparison of the reading data with national figures.

As was mentioned earlier, the disadvantage of the NFER 'A' is that no large scale survey has ever used it. Hence there are no normative data available on class or area differences, for example. However, this difficulty is partly ofset by the system of standardised scoring widely used by the NFER, which enables rough comparisons to be made between the results of different tests. The London Literacy Survey (ILEA 69 and 72) for example, used another NFER test, the SRA (Streaming Research 'A'), the results of which are also expressed in terms of standardised scores. The EPA project's attainment research used the SRA also. (Halsey et al, 73, Payne 74.) It was decided that even approximate comparisons with these studies would be

valuable, since both dealt with London children; one with children from all over Inner London, and the other with children from a particularly deprived urban area. The London Literacy Survey concentrated on children at the extremes of the reading distribution, and isolated a group of 'poor' readers, with standardised scores below 80, and a group of 'good' readers, with scores of 115 or above. Using the same method on the present sample data, on the EPA data, and on the standardisation figures for the NFER 'A', the following table was constructed.

TABLE 59

Comparison of reading distributions from different studies: proportions of good and poor readers

	NFER 'A' Standardisation	Dagenham (NFER 'A')	London Lit. (SRA)	Non-immig. London EPA (SRA)
% below 80	8.6	6	17	19
% 115 and above	16.7	4	10	8
Approx. N.	7000	100	31,300	878

At the upper end of its distribution, the Dagenham sample resembles the London figures most closely, whereas at its lower end, it is more similar to the NFER standardisation figure. Overall, even on the basis of small numbers such as these, Dagenham appears to lack the very poorest readers found in the inner city areas, and at the same time, to be very short of 'high flyers.' This impression of a limited spread of attainment is confirmed when a comparison is made amongst the standard deviations of the various distributions. (The EPA report only gives figures separately for the two sexes, so these are reproduced here.)

Table 60

Comparison of reading distributions from different studies; means and standard deviations

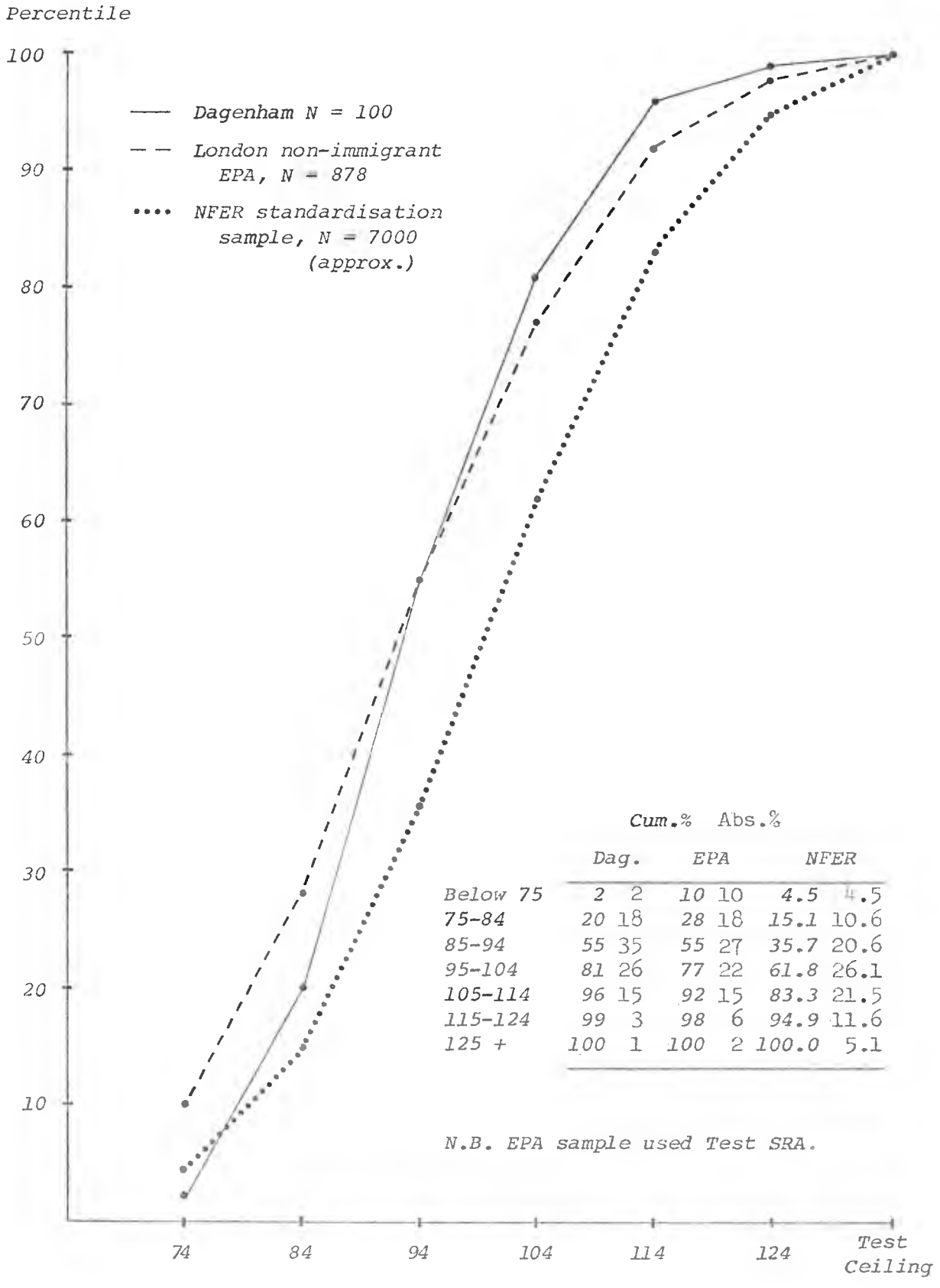
		Mean	S.D.
NFER 'A' and SRA standardisations		100	15.0
Dagenham (NFER 'A')		94.2	11.5
London Literacy (SRA)		94.4	15.2
Non.-immig. London	G	95.3	14.5
EPA (SRA)	B	92.4	15.1

The two London studies each revealed a spread of scores comparable with that of the standardisation sample, but with a lower distribution mean. The Dagenham children showed a similar, low, group mean score, but their distribution had a considerably lower S.D. also.

Figure 50 and its accompanying table give a more detailed breakdown of the distributions, and show that, as suspected, Dagenham has an excess of below average readers, but not more than its quota of the worst readers of all.

The correlation between the two sets of reading scores

A scattergram was plotted of Southgate versus NFER 'A' reading scores, and is given in Figure 51 below. The 'ceiling effect' on the Southgate was made very clear by this procedure, and was reflected in the low (for this sort of comparison) correlation of 0.70 between the two sets of scores. Only about half the variation in NFER scores can be accounted for by variation in the Southgate. This is partly due to the

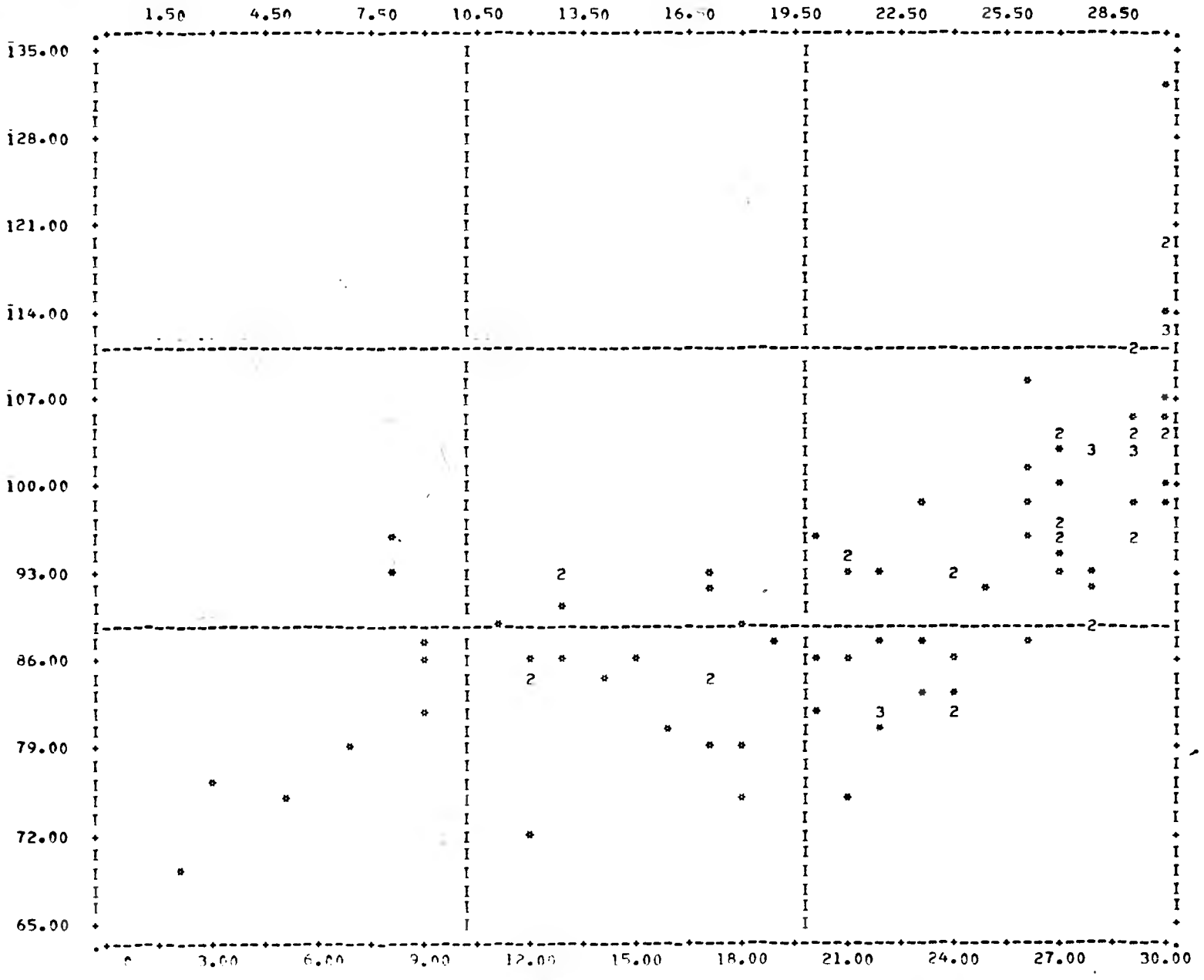


	Cum.% Dag.	Abs.% Dag.	Cum.% EPA	Abs.% EPA	Cum.% NFER	Abs.% NFER
Below 75	2	2	10	10	4.5	4.5
75-84	20	18	28	18	15.1	10.6
85-94	55	35	55	27	35.7	20.6
95-104	81	26	77	22	61.8	26.1
105-114	96	15	92	15	83.3	21.5
115-124	99	3	98	6	94.9	11.6
125 +	100	1	100	2	100.0	5.1

N.B. EPA sample used Test SRA.

Figure 50. Cumulative frequency curves for Dagenham sample, London non-immigrant EPA, and NFER 'A' test standardisation.

Figure 51. SCATTERGRAM OF (DOWN) NFERA READING TEST SCORE (ACROSS) SGATE - SOUTHGATE SCORE



CORRELATION (R)- .70109 R SQUARED - .49152 SIGNIFICANCE R - .00001

curtailed range of the latter test, but also to the fallibility of the two measures. Both are tests of reading, but probably tap slightly different skills.[1] Further, even as measures of only a limited aspect of reading skill, tests such as these are subject to measurement errors. The correlation between variables is therefore a function of the reliability of their measurement. Even if the correlation between 'true' scores on two variables was perfect, but both variables were subject to errors of measurement, then the obtained correlation cannot be greater than the product of the square roots of the two reliability coefficients.

However, in the present case, the reported reliabilities of the Southgate and the NFER 'A' are both high - 0.95 and 0.96 respectively, which suggests that only a very small proportion of the unexplained variance in NFER scores stems from this source, leaving more to be explained by differences in the skills tapped by the two types of test.

This topic has been discussed at some length to emphasise the limits already imposed upon the size of the correlation coefficients between reading scores and other variables, before the psychological aspects of the relationships have even been considered. Given that both criterion and predictor variables are prone to measurement errors, and that both can be regarded as, at best, partial indicators of their underlying constructs - 'reading ability' or 'help with reading' for example - then even the strongest underlying relationships will yield only very imperfect correlations. This issue is referred to again in the context of 'prediction' in regression analysis, which is discussed in a later section.

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[1] Also, one test is age-corrected; the other is not.

C. The IQ data

The distribution of the full-scale WISC scores is given in Figure 52 (page 281). Because it is an individual test, requiring administration by trained personnel, the WISC has not been used in large scale surveys. There is therefore an unexpected dearth of comparison data to put in perspective the obtained mean of 102.4, i.e., over two points higher than the mean of the test standardisation sample. The best comparison which could be achieved was with data from a study by Jones (1962) of a sample of London children drawn from all social classes. The necessary figures are given in Table 61, below.

Table 61

Comparison of IQ distributions from different studies

	Jones (1962) London children 8 years old. N=80 (40 B, 40 G)		Dagenham sample 7-8 years old. N=100 (52 B, 48 G)	
	Mean	S.D.	Mean	S.D.
WISC Verbal	107.4	13.3	101.6	16.5.
Perf.	104.2	12.7	102.9	13.7
Full scale	106.4	12.1	102.4	14.8

The finding that British children as a group score more highly on the WISC than did the American children in the standardisation sample has been confirmed for the full WISC in studies of Aberdeen children by Belmont and Birch (1966), and of a large sample of Scottish children by the Scottish Council for Research in Education, (1967). Rutter,

Tizard and Whitmore (1970) on the Isle of Wight, Berger and Yule (1971) in Camberwell and Brandis (1974, pers. comm.) in West Ham all used a short form of the WISC, and with the exception of Camberwell girls, all full scale group means were found to be at least 1 or 2 points above 100, rising to an estimated 7 or more points above on the Isle of Wight. Against this background, the figures from Dagenham may be seen as being in accord with what could be expected for a working class sample. The Jones data suggests that a sample representing all social class groups is particularly superior to a working class sample on the Verbal subscale of the WISC.

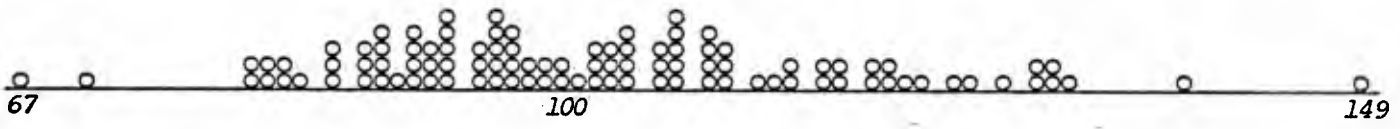


Figure 52. Distribution of Full Scale WISC IQ scores

Regression Analysis of the Reading Data

The analysis of the pilot data confirmed the common-sense expectation that certain attitudes and approaches to the bringing up of children tend to go together. It was further demonstrated that many of these practices, taken singly, could be shown to be significantly related to school achievement. The problem then is to disentangle, from this network of influences, those attitudes and practices which matter from those which themselves do not affect school performance, but which tend to be associated with the more influential variables.

The statistical technique most suited to this task is multiple regression analysis. To quote from the manual to the SPSS computer program, "Multiple regression allows one to study the linear relationship between a set of independent variables and a number of dependent variables, while taking into account the inter-relationships among the independent variables." (Nie et al, 70: page 175.) In order to understand better how this is achieved, simple bivariate regression will be described first, and its extension into multiple regression presented on that foundation.

In simple bivariate regression, what is of interest is the strength of the dependence of the 'criterion' variable on the 'predictor' variable. Put another way, the researcher wants to know the amount of variation in the criterion which can be explained by linear dependence on the predictor. This is achieved by 'fitting' to the data a straight line through the scattergram of predictor against criterion. This straight line, as all straight lines, may be definitively specified by the use of just two parameters,

its slope and its intercept. The equation of the line, and hence of the calculated relationship between predictor (x) and criterion (y), takes the form:

$$\hat{y} = a + bx$$

where '$\hat{y}$'is the estimated value of y,'a' is the constant or intercept, 'b' the slope, and 'x' the predictor. The discrepancy between an actual and a predicted criterion is defined as $(y - \hat{y})$, and is known as the residual. The equation of the line is calculated by 'least squares' fitting techniques, i.e., by minimising the sum of the squared residuals $\Sigma(y - \hat{y})^2$ using the methods of the differential calculus. Since for no other line would $\Sigma(y - \hat{y})^2$ be smaller, then no other line would be as 'close' a fit to be observed points. In other words, optimal prediction is achieved.

The effectiveness or accuracy of the derived equation as a predictor of 'y' may be estimated in a number of different ways, one of the most useful being in terms of 'the percentage of variance accounted for.' In more precise terms, this is the ratio of explained variation in 'y' (i.e.,explained by linear dependence on 'x') to the total criterion variation. The symbolic notation commonly used for this ratio is 'R^2', since the square root of the ratio is the Pearson product-moment correlation between variables 'x' and 'y'. R^2 is calculated from the following relationships:

Residual sums of squares $(SS_{res}) = \Sigma(y - \hat{y})^2$

Regression sums of squares $(SS_{reg}) = SS_{y(total)} - SS_{res}$

$$R^2 = \frac{SS_{reg}}{SS_{y(total)}}$$

(A comment may be made at this point concerning the meaning of the word 'prediction' as used in the context of regression analysis. In lay terms, to predict something implies a certain closeness of fit between predicted and observed values. In a statistical sense, a variable could be considered a very useful predictor of another even if it only accounted for 25% of criterion variation. It is for this reason that a measure which is recognised as only a partial index of an underlying variable may still be valued as a predictor in its own right.)

Multiple regression

Multiple regression is used when the criterion is to be predicted from more than one independent variable, i.e., using more than one source of information. In the simplest case, with two independent variables, there are two fundamental questions which must be asked:

1. Does multivariate regression result in a more accurate prediction of 'y' than either of the two possible simple regressions?
2. In the multivariate regression, what are the relative contributions to prediction made by the two independent variables?

If the model is then extended to encompass three or more predictors, Question 1 above must be modified, the new problem being, how to choose the best prediction equation from a pool of potential predictors. The principle behind Question 2 remains as before, i.e., once the items have been selected from the pool, their relative contributions to the prediction may need to be evaluated.

In the present study, it was possible to specify in advance a number of two-predictor comparisons; for example, does an equation incorporating both a home environment measure, and also IQ predict reading score better than either taken separately; and further, what are the relative contributions of each to the final prediction? Overall however, the situation was more commonly that of forming the best equation from a pool of potential predictors, rather than testing specific sets of variables. For this reason, the analysis will largely be presented in 'item pool' terms, with specific hypotheses being highlighted as necessary.

If, in any analysis, a large number of potential predictors are available, it is very unlikely that each will have a unique contribution to make to explaining criterion variance. The more the various predictors are intercorrelated, the less likely this becomes. In this situation, the researcher may simply wish the analysis to produce the 'best prediction equation' - best in the twin senses of highest percentage of variance accounted for, and each variable making a statistically significant contribution to that explained variance. On the other hand, it might be necessary for practical reasons to limit the number of predictors used - for reasons of data collection in an applied setting for example - and the request might therefore be for the 'best three-variable equation.'

Strictly speaking, there is only one way to select the best three-variable equation from a given item pool, and that is to construct all possible three-variable equations, and evaluate them on the R^2 criterion. With small item

pools, and short equations, this is feasible - there are only 10 three-variable equations extractable from an item pool of 5 items for example. However, the number of possibilities increases very rapidly with the size of the pool of predictors, reaching over 15000 possibilities when it is desired to select the best 5-item equation from a list of 20 variables.

Even for an electronic computer, this would be a cumbersome, time-wasting procedure, so computer program packages take short cuts. The most commonly used procedure (Used by SPSS amongst others) is Stepwise Multiple Regression (SMR). To quote from the SPSS manual (P180), "this procedure does not always yield the true optimum, but it usually does fairly well." The 'optimum' here is being defined in terms of the best of all possibilities, as described above.

Stepwise Multiple Regression was the version of regression analysis used on the data from the present study. The first step in SMR is to choose the best single variable equation, i.e., to choose the variable which has the highest bivariate correlation with the criterion measure. The second step is to construct a two-variable equation by selecting another variable to join the first, the aim being to choose that variable which make the best two-variable predictor set when paired with the first-chosen one. (20 original predictors make 19 possibilites at this stage.) The third variable chosen is that which makes the best three-variable equation when it is added to the preceding two, and so on. The process continues until no new variable makes a significant contribution to the explained variation, or until the specified number of predictors has

been added. The increase in multiple R^2 may be monitored step by step as an index of overall prediction success. The further usefulness of such a cumulative R^2 table is limited however, for the following reasons.

Firstly, increase in R^2 is not necessarily of interpretative significance, since the addition of any new variable to a regression equation will always result in an increment in R^2. In the limiting case, where the number of predictors approaches the number of cases being analysed, then R^2 approaches unity.

Significance tests for the contribution of a new variable to explained variation are usually carried out, not on R^2, but on the variable's regression coefficient (i.e., for new variable x_2, the size of the coefficient b_2 is tested in:

$$\hat{y} = a + b_1x_1 + b_2x_2)$$

A difficulty arises, however, because the significance tests routinely performed on regression coefficients are derived from an approach to the partitioning of variance which is different from that underlying a cumulative R^2 table - hence the second problem in relying on R^2, as mentioned above. The issue is taken up in detail below, because, as will be made clear, it is central to the analysis of the data from the present study.

Partitioning of variance in multiple regression analysis

In an R^2 table, the partitioning of variance is hierarchical. So, for example, the predictive accuracy of a 3-variable equation - measured in R^2 terms - is compared with that of the preceding 2-variable equation, and the

quantity "R^2 change" obtained by simple subtraction. Increments in R^2 are calculated similarly as each new variable is added. For the equation:

$$\hat{y} = a + b_1X_1 + b_2X_2 + b_3X_3$$

a cumulative R^2 table will therefore only permit unambiguous interpretation if X_1, X_2 and X_3 are not intercorrelated. If they are correlated, it is not possible to divide up the total variance explained into three uniquely-determined contributions - some of the variance will be "shared", for example, between X_2 and X_3, X_1 and X_3 and so on. The situation may be represented diagrammatically as follows

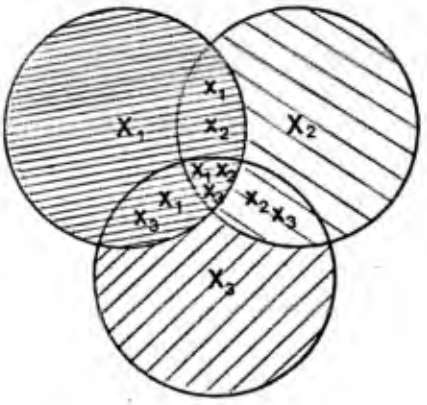


Fig.53 Diagrammatic representation of 'shared' variance.

The area enclosed by the outer solid line represents the total variance explained. In a hierarchical decomposition, the amount of that variance attributed to the first predictor (here X_1) includes not only that due to its direct influence on the criterion, but also that portion due to its indirect influence through the $\begin{matrix}X_1)\\X_2)\end{matrix}\rightarrow$ criterion path, the $\begin{matrix}X_1)\\X_3)\end{matrix}\rightarrow$criterion path and the $\begin{matrix}X_1)\\X_2)\\X_3)\end{matrix}\rightarrow$ criterion path. In

the case of the second predictor to be entered, the portion of variance attributed to it represents its direct influence plus its indirect influence through the $\begin{matrix} X_2) \\ X_3) \end{matrix}\rightarrow$ criterion path. Only that portion of the variance determined uniquely by the third predictor remains to be attributed to that source. Put in more familiar language, X_1 is tested making no adjustments for the other predictors, X_2 is tested after adjusting for X_1, and X_3 after adjusting for ('partialling out') both X_1 and X_2. The R^2 table parallels this breakdown - after step 1, R^2 is equivalent to the area of the top left hand circle, after step 2 to the area of both top row circles, and after step 3 to the total area enclosed by the figure.

This procedure has been described in detail in order to make clear how the alternative method of variance decomposition differs from the above hierarchical approach. In the so-called 'standard regression strategy,' explained variance is decomposed as follows, (N.B. "standard" is used here in a statistical context, not an educational one.)

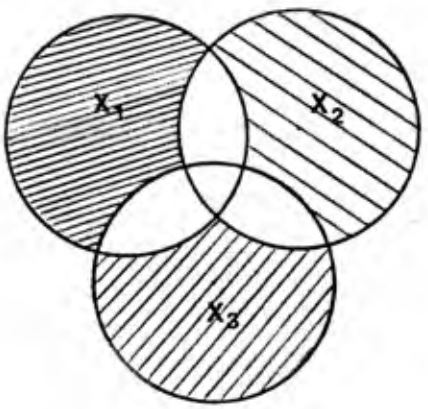


Fig. 54 Diagrammatic representation of the 'standard regression strategy'

Each variable is given credit for its incremental contribution after adjusting for all other variables in the equation, and no variable is given credit for that portion of the explained variance which is not uniquely determined. Hence the contributions assigned to the variables do not add up to the total variance explained.

The standard F test for the significance of a regression coefficient is based on this latter strategy of variance decomposition, not on the hierarchical one. In other words, although variables may be added to an equation one after another, at any one step, the analysis starts from scratch, as it were, and evaluates each variable's contribution with reference to all the others present. As variables are added, the contributions made by any one variable will shift. Hence, the usefulness of a variable X_2 as assessed by its regression coefficient at step 4 may not correspond to its apparent usefulness as assessed by the increment in R^2 which resulted when it was entered on step 2.

Problems of interpretation therefore arise. The strategy routinely adopted statistically speaking, should be the conservative one of discussing each variable in terms of its unique contribution only (i.e., focussing on the significance tests for the regression coefficients at a particular step, rather than the R^2 table.) On this model, adoption of the hierarchical procedure (i.e., relying on the R^2 values) requires justification in terms of underlying theory: does it make theoretical sense to attribute the X_1/X_2, variance portion to X_1, and then to assess X_2 only in terms of what it explains over and beyond that explained by X_1 plus X_1/X_2? (To avoid confusion, it is necessary to point

out here that, in educational research, the opposite course is followed: hierarchical analysis procedures are 'standard' practice, and the 'unique contributions' approach is very rarely encountered.)

The problem is not one of purely academic interest, particularly if there is lack of consensus concerning the nature of the relationships amongst the independent variables. Some authorities maintain that if a particular variable is "causally prior" to another, (Nie et al, 75), or if it has prior "chronology of impact" (Thorndike 73) then it should be entered first, and a hierarchical decomposition strategy employed. This is the implicit rationale underlying the use of IQ or social class as covariates in analyses of school attainment. (Making a variable a covariate in a conventional analysis of variance is equivalent to entering it first in a hierarchical regression analysis.) Putting it another way, the IQ and social class information is treated as determining the type of input to the following variables in the equation - input for which appropriate adjustments must be made.

It has already been stated, however, that "IQ as input" is not accepted as axiomatic in the present study. Further, social class is treated here not as a "concrete" entity which is input to something else, but as a non-behavioural label of group differences, the effects of which need explaining in behavioural terms.

It is for these reasons that the procedures employed in regression analysis have been examined in such detail. The intention was to demonstrate that SMR is an immensely powerful tool, but that it is a tool nonetheless, and hence

answers only the questions which it is asked. To take a particularly relevant example, that of the relative contributions of IQ and a home background index, e.g., help with reading, to reading attainment, then, depending on the type of variance decomposition specified, three different results could be obtained as represented by the figures below.

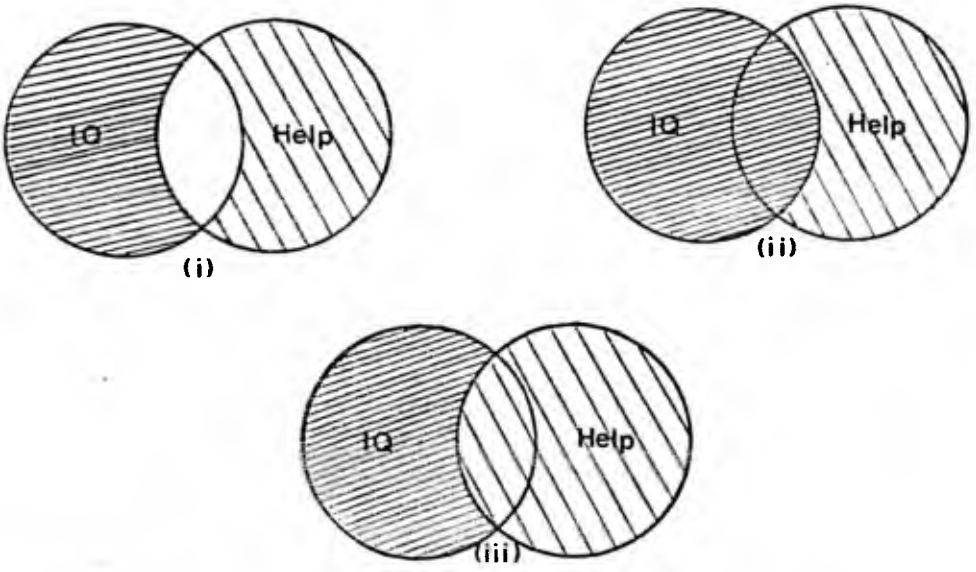


Fig. 55 Three types of variance decomposition

Figure (i) represents the standard regression strategy, i.e., only unique contributions considered. Figures (ii) and (iii) represent hierarchical strategies, with IQ and 'help' being the first entered variable respectively.

In the description of regression analysis given at the beginning of this section, it was stated that the analysis selected its own first-to-enter variable on the basis of bivariate correlation coefficients. This is so-called "free" regression. In the above example, a free regression analysis would first select the variable - say, 'help' - which correlated most highly with reading attainment. The R^2 table would have as its first entry this squared bivariate

correlation, and as its second entry, the squared multiple correlation from the 2-variable equation.

If, on the other hand, for reasons of 'causal priority' or similar, it was decided to ensure that IQ was entered first, this would be achieved by means of 'forced' regression, in which the analysis enters variables in a pre-specified order, determined by the researcher. In this case, the R^2 table would have as its first entry the squared bivariate correlation of IQ with reading, and as its second entry, the same squared multiple correlation as previously. These two R^2 tables reflect the partitioning of variance illustrated in figures (iii) and (ii) respectively. If, however, the 2-variable equations resulting from the two analyses are examined, they will be found to be identical, with significance tests employed on the coefficients reflecting the partitioning of variance represented in Figure (i) above.

The point which needs to be stressed is that in an R^2 table such as the one above, different strategies are being employed to assess the relative contributions of the two variables - a conservative strategy for the second entered, and a generous one for the first entered. The interpretive significance of this difference in strategies will depend, as described above, on the nature of the relationship between the two independent variables. This matter will be discussed in particular detail for the case of IQ and home background variables, when the relevant part of the analysis of the present study data is reported.

Model building

Having recognised that multiple regression analysis cannot provide the 'right' answer to a problem, in that it cannot answer unasked questions, it becomes necessary to plan the best way of using the technique as a tool in finding solutions to specified problems.

Reviewing the reports of studies which used regression techniques to analyse their data, it became apparent that they all shared the same serious shortcoming. (Dave 63, Wolf 64, Peaker 67, Wilson 71, Marjoribanks 74, Barton et al, 74.) As described in the preceding section, regression analysis is a process of quantifying the relationship between dependent and independent variables, i.e., expressing that relationship in a mathematical form. The mathematical form most commonly employed is that of a linear equation, for example,

$$y = a + b_1x_1 + b_2x_2 + e$$

where e is the error of prediction.

In other words, a model is being built to represent the quantitative relationship between criterion and predictor variables.

The problem with stopping the analysis at this point - the shortcoming referred to above - is that doing so transgresses a fundamental 'law' of research. This is that hypotheses should not be designed and tested on the same body of data, since so doing capitalises on chance effects to a quite unknown extent.

What is happening in regression analysis is that a model is being constructed to describe the relationship between y and x_1, x_2.....x_n, i.e., the process is one of sophisticated

data description. To comply with sound research practice, this descriptive model should then be tested on a fresh body of data, i.e., new values of $x_1 \ldots\ldots x_n$ should be fed into the derived equation, and the success of the prediction of y assessed using the R^2 statistic. If this second step is not taken, then the quantitative aspect of the relationship in question is never tested.

It was planned therefore to divide the present study data into two parts. Using the first group of cases, regression techniques would be applied, and a 'model' built. This model would then be tested on a completely fresh group of children, and its success evaluated.

Details of how subdivision of the sample was accomplished are given in the appropriate section below, but before then it is necessary to describe briefly computations which took place before the division was made.

Recoding of variables

In the preceding discussion of regression analysis, frequent use was made of the word 'variable,' without any provisos being made about the nature of the measurements required in any particular context.

Briefly, the mathematical system underlying the type of regression analysis discussed here - the so-called 'general linear model' - requires that the dependent variable be in metric form, but places no restriction on the nature of the independent variables. To use current terminology, metric and categoric variables are equally acceptable. (The technique by which categoric information is incorporated into a quantitative model is by the use of 'dummy' variables. This

technique will not be described in detail here, but it is essentially a matter of treating each category of a nominal variable as a separate variable, and assigning scores depending on the presence or absence of each case in that category.) However, having established that, in theory, any kind of variable could be used a predictor in regression analysis, it was discovered that the practical computing arrangements employed in the present study favoured the incorporation of a particular restriction into the coding of the variables. While the routines used could handle categoric variables with three or more levels, it was found that all the analysis procedures and interpretation would be facilitated if only dichotomously coded categoric variables were used. A two-way classification may be represented by only one dummy variable (Presence/Absence of one category provides all the necessary information) which may then be entered into the analysis as a 0/1 coded metric variable, and analysed as such. Classifications with more than two levels require two or more dummy variables to preserve all their information, which makes the analysis more laborious to perform - the computer program can cope automatically with two levels, but needs help with three - and the output more difficult to understand. Further, the automatic facility of the SPSS 'Regression' subprogram to handle dichotomies extends to its computation of correlation coefficients. Before commencing regression analysis as such, the program needs to assemble a matrix of correlation coefficients. If input is restricted to metric or two-way categoric variables, or any mixture of the two, then this procedure takes place automatically, and the program computes the appropriate

coefficient for each type of variable pair. The possibilities are as follows :

(1) Metric/metric needs Pearson coefficient.

(2) Metric/dichotomy needs Point-biserial coefficient.

(3) Dichotomy/dichotomy needs Phi coefficient.

These three different types of coefficient are all 'compatible' in that regression analysis can be performed on the mixed matrix so formed.

Other types of correlation coefficient, such as rank-order statistics, are not produced automatically by the program when the need arises, and would require extensive data-handling procedures in order to assemble the desired matrix.

In the present study, all the categoric variables under the heading 'Child-rearing methods' had been coded as dichotomies prior to card punching (see page 255) Some of the demographic variables had, however, been coded with multiple response categories: for the purposes of regression analysis, it was necessary to recode these variables also as dichotomies. The data from the present study was therefore examined, and categoric variables with three or more levels were recoded as summarized in Table 62 below.

Table 62 Recoding of demographic variables

Variable	Original coding	Recode
Social Class	111NM, 111M, IV + V, Unclass.	111NM, Other
Mother working	Not working, part-time, full-time	Not working, working
Mother's social class	111NM, 111M, IV + V, Unclass	111NM, Other.
Mother's education	Stayed on, left with regret, left as soon as could.	Left as soon as could, Other.

The family size variables were left as they were, (i.e., a family of four received a score of four on 'Total family size') and so were treated as metric variables throughout the analyses. The only categoric variable which could not be recoded was 'school', so special mention is made of this variable when the results of the analyses are reported.

Correlation matrix from full sample (i.e., Undivided, N=100)

When all necessary recoding was completed, a full correlation matrix was computed on the undivided sample, to provide the reference information on the simple bivariate relationships amongst the variables, which would later be required for purposes of interpretation. It also provided a preliminary idea of which variables were associated with reading success in this sort of sample, and which apparently were of little consequence. Since more sophisticated analysis techniques were to follow, however, detailed attempts at interpretation were not considered appropriate at this stage. The matrix is given in full in Appendix 6.

Table 63 below shows a section of the full matrix, comprised of the correlations between the various home background and IQ variables and NFER reading test score.

(Since it was not possible to express the relationship between 'school' and reading test score in comparable terms to those above, a one way-analysis of variance was carried out: no significant school effect was revealed.
$F = 0.89$ with 3,96 df. $p = .45$)

Table 63. Matrix of correlations of reading score with home background and IQ variables.

	SEX	CLASS	CIRCS	TOTALN	NOLDER	NYOUNGER	MWORKING	MEDUC
NFERA	-.0701	-.1663	-.0630	-.1497	-.1556	.0084	.0572	-.2261
	(.244)	(.049)	(.267)	(.069)	(.061)	(.467)	(.286)	(.012)

	CRINVEN	CHAT	AWKQS	ASP	MTOM	MTOC	CTOM
NFERA	.4317	.2280	.3293	.1798	.0915	.2747	.6152
	(.001)	(.011)	(.001)	(.037)	(.183)	(.003)	(.001)

	VERBIQ	PERFIQ	FULLIQ
NFERA	.4895	.4650	.5400
	(.001)	(.001)	(.001)

(N = 100. Probability level in brackets beneath each coefficient.)

Dividing the sample

As has been described, it was necessary to divide the sample into 'model building' and 'model testing' components. However, since published studies had not adopted this strategy, there were few guidelines available as to how to proceed. Eventually, following statistical advice, the original N = 100 sample was divided into a N = 60 component for model-building, and a N = 40 component for testing. The N = 60 group was selected using stratified sampling as far as was possible with the numbers available - there were equal numbers of boys and girls, equal numbers from the four schools, and the social class composition was the same as in the original sample.

Unfortunately, what was not checked, but which with hindsight should have been, was the degree of similarity between the three group means, i.e., of the N = 100, N = 60 and N = 40 samples. The consequences of this oversight are described in detail in the section on 'Model testing.'

Model building on the N = 60 sample

From the beginning, it was planned to carry out two model-building exercises, corresponding to two different 'pools' of information. In the first 'pool,' there would be data on home background only. The second pool would contain all this information, plus IQ data. The idea was to compare the efficiency of prediction of school achievement in the two instances, i.e., to see how prediction was improved in these circumstances by access to IQ information. In the context of the lengthy discussion on partitioning of variance given previously, it will be recognised that this

is a 'hierarchical' strategy - the contribution of IQ is being assessed over and beyond that already provided by home background variables. The decision to build two sorts of model was however considered to be justified on practical grounds. IQ is a much-vaunted educational predictor, and it was believed to be of interest to find out if knowledge of the right sort about a child's home background could predict attainment with comparable success.

In practice, the IQ data was used in various types of analysis, corresponding to both traditional and controversial causal models, so further discussion of the issues involved here is postponed until the relevant results are reported.

In practical terms, 'model building' to describe the relationship between home environment factors and reading attainment meant deriving the best prediction equation from the information available. Since the usefulness or otherwise of different sources of information was of particular interest, a decision was made at this stage to add one more step to the analysis, and first attempt to build a model using the child-rearing variables only. Demographic data would then be added to the information pool, and a new model built. The addition of IQ data to the pool was to remain, as before, the final step in the procedure.

Model I: Child-rearing data only

A free regression was run with the following variables as potential predictors: aspirations (Asp), child-rearing inventory score (CR Inven), Bernstein 'Chat' scale score (Chat), Bernstein 'Awkward questions' scale score (AwkQs), child reads to mother (CtoM), mother reads to child (MtoC),

and reading model provided by the mother (MtoM).

Only two of these variables made a significant contribution to the prediction of NFER reading test score, 'child reads to mother' entering first, and 'aspirations' second. After the first step R^2 was .31, i.e., about 30% of the variance in NFER scores was 'explained' by the 'child reads to mother' variable. After the second step R^2 rose to .33, corresponding to a multiple R of .57. Details of this, and subsequent analyses, are given in Appendix 7. (N.B. it will be noticed that the bivariate correlation coefficients appearing in the printout in Appendix 7 differ slightly from those previously reported in Table 63 This is because Table 63 shows N = 100 sample figures while the present calculations are performed on N = 60. Fluctuations such as those observed are to be expected when working with small samples and measures of untested reliability. However, this is not of concern, since the aim of the present analysis is not to extract numerically precise solutions, but rather to reveal in general terms those variables which are consistently chosen to enter prediction equations, and those which uniformly have little independent contribution to make.)

Using the SPSS 'Regression' program, it is possible to specify the significance level beyond which variables are not brought into the equation being constructed. In the present case, a very lenient 'significance stop' had been employed, so the program continued to add variables, step by step, until all had entered the equation, even though contributions from the third variable onward were statistically non-significant. The final R^2 value was 0.34, i.e., less than a further 2% of criterion variance

had been explained by the addition of the last five variables.

After the second step, the partial correlations of the last five variables with the criterion (NFER score) were as follows: (simple values given for comparison)

(N = 60)

	Partial	Simple
MtoC	.091	.23
MtoM	-.040	.10
CRI	.097	.26
Chat	.061	.23
AwkQs	.082	.24
CtoM	(adjusted	.56
Asp	for)	.41

The analysis was interpreted as indicating that, of the constellation of child-rearing behaviours which tend to be associated with one another, it is the mother's willingness to listen to her child read which exerts the strongest influence on his reading attainment. 31% of criterion variance was explained by this factor alone, and all the other variables considered only added another 3%. The very small independent contribution made by the Bernstein language variables is particularly worthy of note.

At this early point in the analysis, it was possible to draw a few tentative conclusions about the relative importance for reading attainment of the home background variables, so far considered.

Firstly, the behaviour which stands out from all the rest as a predictor of success is the mother's willingness to hear the child read. The other sort of help she might give, that of reading to the child herself, appears to be considerably less important. This is indicated by the

relative magnitude of the two simple bivariate correlations with reading score,

	CtoM	MtoC
NFER	.56	.23

and the partial correlation of 'MtoC' with reading, after allowing for the effect of 'CtoM',

Partial r = .11

Secondly, neither the child rearing inventory developed in the pilot, nor the two Bernstein scales have much to add to prediction when the effect of the 'child reads to mother' variable has been allowed for. The relevant partial correlations of these three variables with NFER reading test score, after adjusting for 'CtoM' only are as follows:

	Inventory score	Chat	AwkQs
Partial r with NFER score	.13	.07	.09

Thirdly, the reading model provided by the mother appeared to have little influence on reading attainment once its association with the 'child reads to mother' variable had been allowed for. The relevant simple and partial correlations are given below.

Simple bivariate corrs.

	'MtoM'	'CtoM'
'CtoM'	0.23	
NFER	0.10	0.56

Partial corr.

'MtoM' with NFER, adjusting for 'CtoM' : -0.04

In an attempt to extract the maximum amount of information from the data, a further set of calculations were

performed, using a predictor pool which included 'created' variables. This procedure is described in the following section.

'Interaction' variables

In conventional Anova terms, the finding of 'a significant interaction effect' means that there is an effect on the criterion of particular combinations of factor levels, over and beyond the factor main effects. Well-recognised procedures exist for calculating interaction terms in this context, i.e., when the 'main effects' are represented by categoric variables. In the context of regression analysis, however, when the predictor set may include both categoric and metric variables, the calculation and interpretation of interaction effects is much more problematic, not least because suitable procedures are not available in statistical analysis program packages.

In the present study, because of the mixed nature of the measures used, and the crudeness of the coding systems employed for some of the variables, a full investigation of interaction effects in the Anova sense was not considered a worthwhile proposition. A much more limited investigation was, however, carried out into the relationship between certain 'created' variables and the criterion: these created variables had certain characteristics in common with 'interaction terms' in the Anova sense, and so were given the labels Interaction, a, b, etc. in the analyses. Specifically, variables were created which were the product of a metric and a categoric variable. So, for example,

'IntA' = 'CtoM' x Child rearing inventory score

The rationale for this procedure was that, although the categoric variables in the present study, especially 'CtoM' and 'Asp', were themselves powerful predictors of reading, variables created from them by the above procedure might be even better predictors, if only because the new variables would necessarily contain more information than the either/or content of the originals.

Analyses using created variables were seen as attempts to squeeze the maximum amount of predictive power out of the data. It was recognised, however, that ease of interpretation would probably suffer in the pursuit of this goal, because the variables created had no straightforward 'real world' meaning, and only limited meaning as interaction terms. (To clarify this latter point; information was only added to the original dichotomous coding for those individuals who scored '1'. All individuals who originally scored '0' continued to score '0' on the product variable. Individuals who originally scored '1' were, however, separated out according to their scores on the metric variable contributing to the product term.)

Using the SPSS 'Compute' facility, variables were created as shown in Table 64

TABLE 64 Construction of product variables

Product			Name of new variable
'CtoM'	x	Inventory score	IntA
'CtoM'	x	'Chat'	IntB
'CtoM'	x	'AwkQs'	IntC
'Asp'	x	Inventory score	IntD
'Asp'	x	'Chat'	IntE
'Asp'	x	'AwkQs'	IntF
'MtoC'	x	Inventory score	IntG
'MtoC'	x	'Chat'	IntH
'MtoC'	x	'AwkQs'	IntI

The variable 'MtoM' which described the mother's own reading habits, was dropped from the analysis at this stage. It was considered that its low partial correlation with reading (-0.04, adjusting for 'CtoM' and 'Asp') confirmed the pilot study's finding of this variable's non-significant independent contribution.

A regression analysis was run, again using a lenient significance stop, with all the above created variables added to the previous item pool, minus the 'MtoM' variable. Once again, only two variables made a significant contribution to prediction, the created variable IntC ('CtoM' x AwkQs') entering first, followed by IntF ('Asp' x AwkQs'). The analysis is summarized below, and presented in detail in Appendix 7

Dependent variable: NFER 'A' (figs. adjusted to 2 decimal places)

Variable entered	Multiple R	R Sq	(Simple R)
IntC	0.59	0.34	(0.59)
IntF	0.60	0.36	(0.46)

At this step, the partial correlations of all the other variables in the pool had fallen below 0.1.

Using the newly-created variables had produced a marginally more efficient 2-term equation. As may be seen, R Sq. improved from 0.33 to 0.36, corresponding to an increase in multiple R from 0.57 to 0.60. (All figs. rounded to 2 decimal places.) The precision in the estimate of the criterion also improved, as reflected in the fall of the overall residual mean square from 77.02 in the simpler equation to 73.50 in the created variable equation.

Before moving on to describe the regression equation itself, it is worth repeating that the analyses at this

stage were performed with a limited aim; that of maximising the percentage of criterion variance which could be accounted for using the information in a particular item pool. The analyses were not investigations of interaction effects as that expression is commonly understood: attempts were not made to estimate interaction effects 'over and beyond' main effects, nor indeed to separate out the contributions of any of the predictor variables.

The regression equation

The actual equation developed to predict reading score from the child-rearing data was as follows:-

Predicted NFER score = (0.49 X IntC) + (0.17 X IntF) + 88.28

where, IntC = 'CtoM' X AwkQs and IntF = Asp X AwkQs

The values 0.49 and 0.17 are called partial regression coefficients, since they are the result of 'controlling for' or 'holding constant' other variables. To be specific, 0.49 units is the expected change in the criterion resulting from a change of 1 unit in IntC, IntF being held constant meanwhile.

Since however it cannot be assumed that one unit of measurement on IntC is equivalent to one unit on IntF, the relative contributions of the two variables are best determined from the 'normal' equation i.e., the equation produced by using standardised variables. This equation was:

$$Z\hat{y} = (0.49 \text{ X } ZIntC) + (0.15 \text{ X } ZIntF)$$

Here, 0.49 and 0.15 are standardised partial regression coefficients. The standardised simple regression coefficient between two variables is equal to their bivariate correlation coefficient - the familiar simple r. Hence,

the 'partial' values of the coefficients may profitably be compared to their 'simple' values, as follows,

	Standardised partial regression coefficient	Standardised simple regression coeff. (=r)
IntC	0.49	0.59
IntF	0.15	0.46

The interpretation of all this is that one standard deviation unit of change in IntC produces a much larger change in the criterion than does an equivalent change in IntF - which is important when it is recalled that IntF was selected as the best second predictor available. Further, the differential reduction of the partial from the simple coefficients is worthy of note - much of the bivariate correlation of IntF with the criterion is 'borrowed' via the IntC/IntF correlation.

Because the use of 'created' variables has made the preceding analyses intuitively less easy to understand, equivalent information is given below for the simpler equation first developed.

Unstandardised prediction equation $\hat{y} = (9.78 \times \text{CtoM}) + (3.73 \times \text{Asp}) + 88.13$

Standardised prediction equation $Z\hat{y} = (0.47 \times Z\text{CtoM}) + (0.16 \times Z\text{Asp})$

	Standardised partial regression coefficient	Standardised simple regression coeff. (= r)
CtoM	0.47	0.56
Asp	0.16	0.41

The differential reduction from the simple to the partial coefficients is again apparent.

Residuals

Using a regression equation, an estimated value of the criterion may be calculated from a knowledge of predictor values. The discrepancy between this calculated value ($\hat{y}$) and the observed criterion value (y) is known as the residual. Hence the residual sum of squares is a measure of the amount of criterion variance which the regression equation has not been able to 'explain'.

The various F-tests employed during a regression analysis use this residual sum of squares (divided by the relevant degrees of freedom) as their 'error' term. Such a usage requires that the residuals follow a normal distribution. Following the advice of Draper and Smith (1966) in their book 'Applied Regression Analysis', this assumption was checked by plotting a histogram, as shown (Figure 56), of the residuals from the created variable equation. No violation of the normality assumption was apparent.

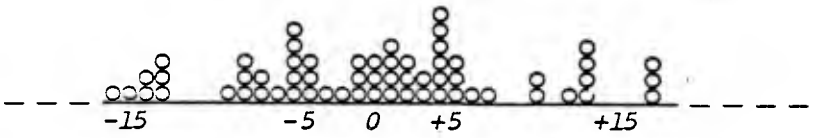
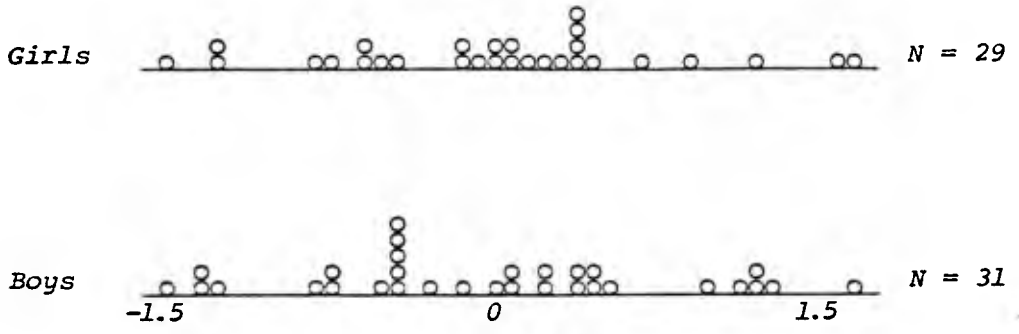


Figure 56. Unstandardised residuals from equation: $\hat{y}$ = (.49 x IntC) + (.17 x IntF) + 88.28

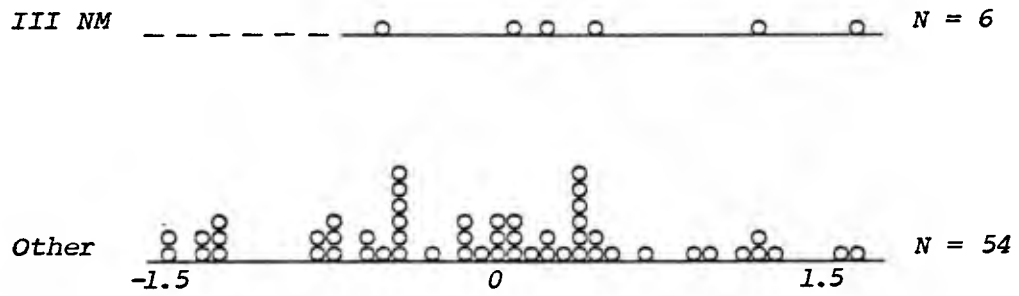
Various other graphical means of examining residuals are suggested by Draper and Smith; in particular, plots against $\hat{y}$ (i.e., estimated y), against the predictor variables from the equation, and against potential predictors are recommended. These examinations were carried out and are reported in Appendix 7. The first two types of plot mentioned here are essentially checks on the adequacy of the analysis already performed. The third - plotting residuals against potential predictors - gives guidance on how the analysis might be extended. Since the interest of the present analysis at this stage was to discover if various demographic groups showed a basic difference in level of reading attainment, over and beyond the variation already explained, plots were made of the residuals against sex, social class, family size, mother working, mother's education and family circumstances, and also against school attended. Full details are given in Appendix 7, but in brief, the findings were that only the social class and school variables showed any suggestion of group differences. Contrary to established findings, there was no evidence of a sex effect. These three plots are given in Figure 57 below. (It is standardised residuals which are plotted here, since this is the form in which they are output for analysis by the computer.)

The suggestion of a schools effect was very slight, as may be seen from inspection of the histograms. It was in fact found to be statistically non-significant, as indeed the raw-data schools effect had been. No further consideration was given to it.

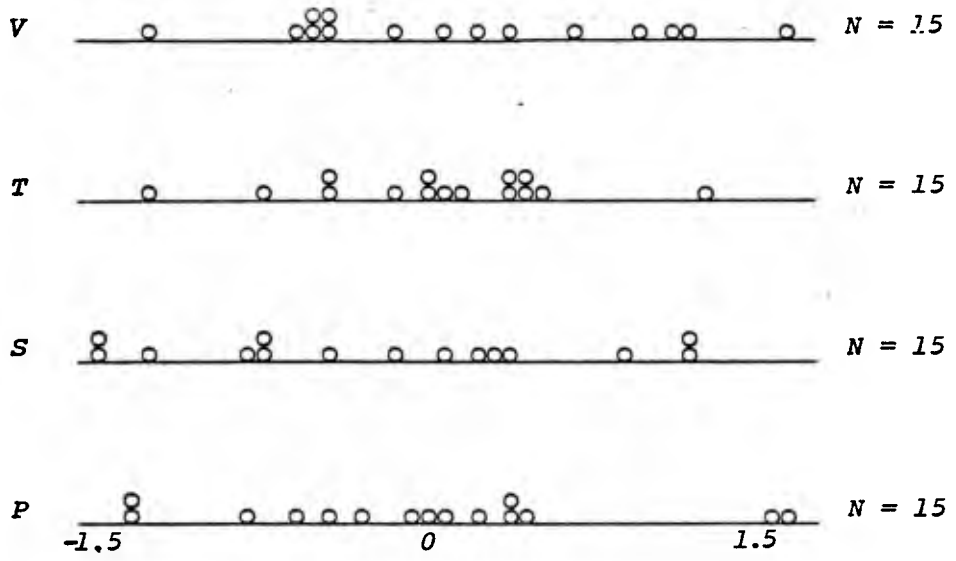
The social class difference was larger, and also of



i) Sex



ii) Social class



iii) School

Figure 57. Standardised residuals from Model I equation plotted by sex, social class and school attended.

more theoretical importance in the context of the present study. Particular attention was therefore paid to this variable's contribution to prediction in subsequent analyses.

Reference to the simple bivariate correlations of the demographic variables with the criterion confirmed that only social class had a significant contribution to make. In the N = 60 sample, its point-biserial (Manual/Non-manual) correlation with NFER score was 0.24, which corresponded to a significance level of 0.03. (The next highest correlation was that of mother's education at 0.15, which was not statistically significant.) Examination of partial correlations, i.e. after controlling for IntC and IntF, led to the same conclusions.

Model II: Demographic variables added to pool of predictors

A new pool of potential predictors was constructed, comprised of 'CtoM', 'MtoC', 'Asp' and the same created variables as before, plus the demographic variables social class, sex, family circumstances, indices of family size and mother's educational level. A free regression analysis was run, again using a lenient significant stop.

The alternative to this approach would have been to run an analysis with just IntC, IntF and social class as predictors. The item pool method was chosen however, because variables are selected to enter a regression equation not only on their correlation with the criterion, but also their correlation with previously entered predictors. This pattern of intercorrelations shifts as variables are added to the item pool, so the variable which was the best second predictor on one run may be marginally superseded on another.

The present case turned out, as it happened, to be a good example of this sort of occurrence.

A three-variable equation was produced by the regression analysis. The variable IntC (i.e., the product of CtoM and AwkQs) entered first, as previously, and was followed by Social Class, then Asp. The changes in Multiple R and Multiple R.Sq are given below. (cumulative figures.)

	Multiple R	Multiple R.Sq
IntC	0.59	0.34
Class	0.62	0.38
Asp	0.63	0.39

No further variable made a significant contribution to prediction.

The suggestion, resulting from the preceding analysis of residuals, that social class as a variable had a small independent contribution to make, was borne out in practice, since a further 3% of criterion variance was explained as a result of its addition to the predictor pool. The precision of the estimate of the criterion was also improved, since the residual mean square was now only 70.79 instead of the previous best of 73.50.

(Purely out of interest, another regression was run with IntC, Class and IntF as predictors, i.e., replacing Asp by its product term with AwkQs. Prediction was found to be very slightly inferior, illustrating the point made above about shifting inter-correlations.)

It is, incidentally, worth noting at this point that only limited significance may be attached to social class being chosen as second predictor in the above analysis. Variables which are highly correlated with others already in the equation are less likely to be chosen than variables

representing a new 'dimension.' In this case, social class, as a demographic variable, had more 'new' information to contribute than the other indices of child-rearing practices. It is also of interest to note that sex, family size, and mother's educational level were not selected for the prediction equation. After adjusting for IntC, Class and Asp, their partial correlations with the criterion were all very low, and well below statistical significance. Full details are given in Appendix 7.

The regression equation

The prediction equation was now:-

$$\hat{y} = (0.51 \times IntC) - (6.49 \times Class) + (2.93 \times Asp) + 100.74.$$

In the normalised form, this becomes:-

$$Z\hat{y} = (0.51 \times ZIntC) - (0.19 \times ZClass) + (0.13 \times ZAsp)$$

(The reason for the presence of a minus sign in these two equations is simply that Class was coded conventionally, i.e., with the higher numerical value coding the lower social class.)

As previously, the partial standardised regression coefficients were compared with their simple bivariate values, i.e., with their bivariate correlation coefficients.

	Standardised partial regression coeff.	Standardised simple regression coeff. (=r)
IntC	0.51	0.59
Class	-0.19	-0.22
Asp	0.13	0.41

This table adds support to the idea that the contribution of social class to prediction is relatively independent of any association it may have with the 'Child reads to mother' variable, since its partial coefficient is not very much smaller than its simple counterpart. The same may not be said of Asp however, and it appears that much of the

bivariate correlation of Asp with the criterion is due to its association with 'Child reads to mother,' or, as here, with IntC. (Simple r for Asp/IntC is 0.53.) As before, it may also be seen that IntC is much the most important predictor of those considered so far.

Residuals

The procedure described previously for the analysis of residuals was repeated for this new equation, and is reported in Appendix 7. No violations of the model assumptions were revealed.

In anticipation of a later stage of the analysis, the residuals were plotted against Verbal IQ, and a significant correlation on 0.26 obtained. This indicated that access to IQ information would improve prediction efficiency, as indeed had been anticipated. This issue is developed further in a later section.

Interpretation of analyses so far

Analysis of the second set of residuals completed the 'model building' phase of this part of the study. The end-product was two prediction equations, one derived solely from child-rearing information, and the other from an item pool which also included demographic data. The detailed computations which are described here are a means of squeezing the maximal amount of predictive power out of the sources available - hence the use of created variables and item pools. The conclusions reached as a result of this process were duly tested on fresh data, as will be described in the section which follows. It is important to stress once

again, however, that numerical precision of the order represented here is not an indispensable component of the present analysis. What is really important is the general pattern of the results, and the detailed mathematics must not be allowed to obscure this. Indeed, it would be foolish to place heavy reliance on numerical estimates derived from crude measurements on a sample of 60.

The pattern which emerges is clear. Information as to whether or not a child is reported to read regularly to his mother at home is the single best predictor of reading attainment found so far. It overshadows variables such as aspirations, language behaviour, the reading model of the home, general child-rearing practices, and mother reading to child. Further, when the effect of 'CtoM' is partialled out, the contribution which these other variables make to prediction is much diminished, suggesting that at least some of their simple bivariate effect was 'borrowed' via their association with 'CtoM'.

After allowing for 'CtoM,' the social class of a child's home still appeared to have a small additional contribution to make to explained variance. The mechanism whereby this should be so remains a matter for conjecture - maybe higher social class mothers provide help more efficiently, maybe teachers' expectations are at fault, or maybe there is a genetic component. The effect of social class on attainment is discussed further in a later section (Page 352.)

Model testing

Two equations were developed as a result of the

preceding analyses:

$$\hat{y}_a = (0.49 \times IntC) + (0.17 \times IntF) + 88.28$$

$$\hat{y}_b = (0.51 \times IntC) - (6.49 \times Class) + (2.93 \times Asp) + 100.74$$

where IntC = 'CtoM' x AwQs and IntF = Asp x AwkQs

Although the terms 'predictor' and 'prediction equation' have been widely used, in fact no actual prediction has occurred as yet. The above equations are sophisticated examples of data description, nothing more - they describe the relationship between criterion and predictors which best summarizes the observed data. If it is desired to give the equations the status of psychological models, rather than just descriptions of a particular body of data, then the models must be put to the test, i.e., new values of the predictors fed in, and the closeness of fit of observed and calculated y's must be evaluated. By this means also, capitalising on chance effects in the data, which took place during model building, is ruled out in the testing phase, making it possible to see how well the prediction equation holds up without their benefit.

To test the models, the various predictor values from the N = 40 sample were fed into the above equations, producing two estimates of y, i.e., corresponding to the two models, for each of the 40 cases.

Taking the models one by one, the value of the residual $(y - \hat{y})$ was then calculated for each case, and these values were listed for inspection.

A numerical estimate of the model's efficiency was obtained by calculating R^2, i.e., the percentage of criterion variance it explained. The equation used was:

$$R^2 = \frac{\Sigma(\hat{y}_i - \bar{y})^2}{\Sigma(y_i - \bar{y})^2} \qquad \text{(Draper and Smith 1966)}$$

i.e., the ratio of explained over observed sums of squares.

Before totalling to obtain the required sums of squares, lists were made of the individual squared terms, and inspected, together with the residuals, for evidence of any anomalies. One case stood out, particularly because of the size of its contribution to the total sums of squares, which was over three times as big as any other. (For this case, $(y - \bar{y})^2 = 1663$: for the next largest, $(y - \bar{y})^2 = 493$. $\Sigma(y_i - \bar{y})^2 = 6221$.) The residual for this case was correspondingly large, as is shown in the histogram below.

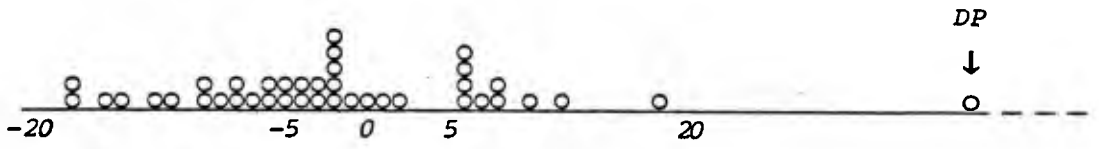


Fig.58 Residuals (unstandardised) for N = 40 sample

Tracing back revealed that a strikingly high NFER reading test score was responsible for both effects.

Since the presence or absence of this one case - child DP - in the sample made such a difference to the 'variance to be explained' term, it was decided to follow the matter further. First, a histogram was drawn up of

the NFER scores in the N = 40 sample. (Figure 59) Two facts were immediately apparent - the low overall level of the scores, and the high score of DP.

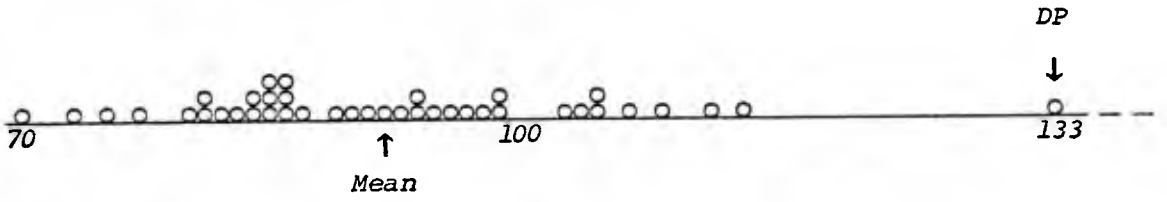


Fig. 59 NFER scores for N = 40 sample

Even in terms of the test standardisation sample, with a mean of 100, a score of 133 would put DP into the top 1.5% of the population. In terms of the Dagenham sample, with a mean of 94.2 (N = 100 figure,) it was calculated that only about 0.04% of the population could be expected to have a score as high as this, or higher. In other words, it would only be expected that about 1 in 2500 children in Dagenham would score as highly as DP.

The effect of DP's inclusion in the model-testing sample was even greater than was immediately realised, because the N = 40 mean NFER score was lower than it ideally should have been. It was pointed out earlier that when the N = 100 sample was first divided, the value of checking the various subsample means had not been appreciated. This was now done, and the figures are given in Table 65 below.

Table 65

Subsample means and standard deviations

Sample	Mean NFER score	Standard deviation
N = 100	94.2	11.5
N = 60	95.5	10.5
N = 40	92.2	12.6
N = 39 (i.e. excl. DP)	91.2	10.9

As may be seen, DP was even more of an oddity in the N = 40 sample than he would have been in the N = 60 one. (N.B. This fall in the subsample means from N = 60 to N = 40 would also have been responsible for the general level of over-estimation in the model-testing, as revealed by the excess of negative residuals, shown in Figure 58 above.)

Although it had by now been shown that inclusion of DP in the model-testing sample had a disproportionate effect on its mean and standard deviation, this was in no sense a good enough case for excluding him. The tactic was therefore adopted of carrying out the model-testing exercise twice for each model - once on the original N = 40 subsample, and once on the N = 39 sample created by excluding DP. In the former case, sums of squares about a mean of 92.2. were used, and in the latter case, about a mean of 91.2. The results in terms of R^2 values are given in Table 66 below.

Table 66

Model testing on N = 39 and N = 40 subsamples

Equation I

$$\hat{y} = (0.49 \times IntC) + (0.17 \times IntF) + 88.28$$

	Sample	R^2%
	N = 40	21.1
	N = 39	33.2
For comparison	N = 60	35.7

Equation II

$$\hat{y} = (0.51 \times IntC) - (6.49 \times Class) + (2.93 \times Asp) + 100.74$$

	Sample	R^2%
	N = 40	25.1
	N = 39	39.4
For comparison	N = 60	39.2

Because of the operation of chance factors in the model building process, it would be expected that all R^2 values would fall on testing. However, the effect of chance cannot be completely eliminated even in the testing phase, and it is this which is responsible for the fractional rise in R^2 in one of the tables.

Overall, it was concluded that the two models had performed very well on testing, since even the N = 40 sample figures revealed a very substantital proportion of variance explained. The effect of DP on the estimates was very apparent however, emphasising the susceptibility to distortion of small scale studies such as this. In larger

studies, the distortion produced by one or two such exceptional cases would presumably be of much less consequence.

The results of the model-testing analysis were interpreted as supportive of the conclusions reached in the study so far - i.e., of the importance of home background factors in determining school success, and in particular, of the importance of the 'child reads to mother' variable.

It was appreciated that the type of regression analysis reported here provides a measure of the maximal amount of predictive information it is possible to extract from the independent variables available - accounting in this case for 39% of criterion variation. Such a general analysis needs to be supplemented however if answers are required to specific questions, e.g., about the relative contributions of named variables to prediction.

In the next section, the general regression analysis of the IQ data is first reported, followed by analyses to answer specific questions concerning the role of IQ in predicting attainment.

The section after that contains supplementary analyses of the home environment data, and describes how they were used, together with the results of the regression analyses, to answer specific questions about the influence of the different home environment variables on reading attainment.

Analysis Extended to Include IQ Data

The IQ data in the present study was analysed in two ways. Firstly, attempts were made to find answers to clearly definable questions - in particular, how does IQ compare with home environment as a predictor of reading attainment. Secondly, the model-building and testing process was repeated, with IQ data included in the pool of potential predictors.

This account begins with the second of the above-mentioned approaches, since it follows on directly from the work described in the previous section.

Model building on the N = 60 sample

The regression analysis program was presented with a large pool of potential predictors, containing the main demographic and child-rearing variables, plus verbal, performance and full-scale IQ scores, plus a number of created variables, including some involving IQ.

A surprisingly large equation was produced from this analysis, with eight items making significant contributions to prediction. The created variable 'IntM', which was the product of 'Child reads to mother' and Verbal IQ, entered the equation first, with an R value of 0.62, corresponding to 38.1% of variance explained. Seven items later, the multiple R was 0.74, with 54.7% of variance explained. Full details of this analysis are given in Appendix 7, including details of the analysis of residuals.

The regression equation

The equation developed from the above analysis was:

$$\hat{y} = (0.27 \times \text{IntM}) - (57.32 \times \text{CtoM}) + (0.75 \times \text{IntC}) - (2.27 \times \text{Nolder}) + (0.21 \times \text{IntP}) - (4.96 \times \text{Class}) - (2.87 \times \text{Meduc}) + (1.33 \times \text{TotalN}) + 106.55$$

where
IntM = CtoM x Verbal IQ
IntC = CtoM x AwkQs
IntP = CtoM x Performance IQ
Nolder = No. older sibs in family
Meduc = Mother's education
TotalN = Total family size

In the normalised form, this becomes,

$$Z\hat{y} = (1.46 \times \text{ZIntM}) - (2.75 \times \text{ZCtoM}) + (0.75 \times \text{ZIntC}) - (0.31 \times \text{ZNolder}) + (1.09 \times \text{ZIntP}) - (0.14 \times \text{ZClass}) - (0.13 \times \text{ZMeduc}) + (0.17 \times \text{ZTotalN})$$

It was recognised that this equation represented the means of squeezing the maximal amount of predictive information out of the data available, but the problem was that it was virtually impossible to interpret it in any detail. The mixture of product and non-product terms meant that straightforward interpretation - psychological or statistical - of the contribution of any one variable could not be made.

The equation was therefore accepted as providing the best prediction available, and model-tested as such, but supplementary analyses were relied upon to answer all other questions.

Model-testing of Equation III

Putting the N = 40 and N = 39 sample figures into the equation produced the following results.

	Sample	R^2%
	N = 40	41.3
	N = 39	47.5
For comparison	N = 60	54.7

Although the eight-variable equation was a cumbersome model, this apparently did not mean that it was an inaccurate one, since the R^2 value obtained on model-testing was very satisfactory.

The overall interpretation which may be placed on the results so far is that knowledge of both IQ and home background variables enables almost half of the variation in reading scores to be accounted for. It will be recalled that knowledge of home background factors alone accounted for nearly 40% of this variation. (The exact figures for N = 39 being 47.5% and 39.4% respectively.)

The difficult question which had next to be tackled was that of the overlap of the two types of predictor, and their relative contributions to the determination of reading achievement. This was done by examining equations smaller than Model III, i.e., equations which contained only those variables to be directly compared. So, for example, the regression equation containing only 'CtoM' and Full IQ was studied in detail. Before this work is reported, however, a brief word is necessary on the interpretation of the created variables employed in the analyses.

Created variables and variance explained

Returning to Equations I and II, (i.e., excluding IQ data,) it was reported that 'IntC', the product of the 'CtoM' and 'AwkQs' variables, correlated 0.59 with reading

score. In such a product variable, assignment of the 34% of explained variance to the two component variables is not possible, but an idea of relative contributions may be obtained by inspecting the relevant simple correlations and R^2 values. These are shown, for 'IntC' and the other significant created variables, in Table 67.

Table 67

Correlations of named variables with NFER reading score

(Rounded figs. from N = 60 sample)

		R	R^2%
1.	IntC (CtoM x AwkQs)		
	CtoM	0.56	30.8
	AwkQs	0.24	5.7
	IntC	0.59	34.3
2.	IntF (Asp x AwkQs)		
	Asp	0.41	17.0
	AwkQs	0.24	5.7
	IntF	0.46	20.8
3.	IntM (CtoM x VerbIQ)		
	CtoM	0.56	30.8
	VerbIQ	0.43	18.7
	IntM	0.62	38.1
4.	IntP (CtoM x PerfIQ)		
	CtoM	0.56	30.8
	PerfIQ	0.34	11.3
	IntP	0.59	34.8

IQ and home background variables

The central question which emerged out of the above analyses concerned the relative importance for reading attainment of home background factors and IQ. In particular, the relative contributions of IQ and the 'Child reads to mother' variables were of interest. The arguments put forward in the earlier discussion of regression analysis

were of direct relevance here, since it had to be recognised that statistical procedures could yield no one 'correct' answer to this problem. The solutions obtainable were seen to be dependent on the form in which questions were asked, which in turn depended on the current interpretation of the meaning of an IQ score. In order, therefore, to present as unbiassed an analysis as possible, the report below gives, for each calculation, or variance estimate, the assumptions underlying the use of the model employed. Only at the end of the presentation of the analyses will an opinion be expressed on the applicability or otherwise of particular models.

The 'Child reads to mother' variable was selected as a powerful environmental influence with which to contrast the importance of IQ in learning to read. The analyses reported below refer to this two-variable comparison. The measure of IQ used was the Full scale WISC score, consideration of verbal and performance factors being delayed until a later section.

For these analyses, the two subsamples were recombined, i.e., the sample size was 100.

Free and forced regression analysis

A regression analysis is 'free' if the order of entry of variables is based only on the size of their relevant correlation coefficients, (simple or partial, as the case may be.) If instead, the order of entry is pre-specified, the regression is said to be 'forced.'

A free regression was first run, with NFER reading score as the criterion, and full scale WISC IQ and 'Child

reads to mother' as the only two predictors. The relevant simple and partial correlations were requested in order to aid interpretation, and were found to be as follows.

(N = 100)	Simple		Partial		
	CtoM	IQ_F		CtoM	IQ_F
IQ_F	0.37		NFER	0.53	0.42
				(controlling for	
NFER	0.62	0.54		IQ_F and CtoM respectively)	

'CtoM' was chosen as first predictor, because of its higher simple correlation. The analysis is summarized below. (Cumulative figures given.)

	Multiple R	Multiple R^2%
CtoM	0.62	37.8
IQ_F	0.70	49.0

The equation produced was:

$$\hat{y} = (10.97 \times CtoM) + (0.28 \times IQ_F) + 60.52$$

or, in standardised form,

$$\hat{Zy} = (0.48 \times ZCtoM) + (0.36 \times ZIQ_F)$$

A comparison was made, as previously, between these standardised partial regression coefficients, and their simple equivalents, obtained without adjusting for the effect of the other variable - these simple values being equal to the bivariate correlation coefficient.

	Standardised partial regression coefficient	Standardised simple regression coeff. (= r)
CtoM	0.48	0.62
IQ_F	0.36	0.54

To complete the data presentation before moving on to interpretation, if the regression is 'forced,' so that IQ_F

enters before CtoM, the following summary table is produced:-

	Multiple R	Multiple R^2%
IQ_F	0.54	29.2
CtoM	0.70	49.0 (cumulative figs.)

The final R and R^2 values are of course the same as previously, since they are based on the same two-variable equation taken as a unit, and that unit is identical to the first one, but reached via another route. These two routes to an R^2 of 49.0% may be illustrated as shown in Figure 60.

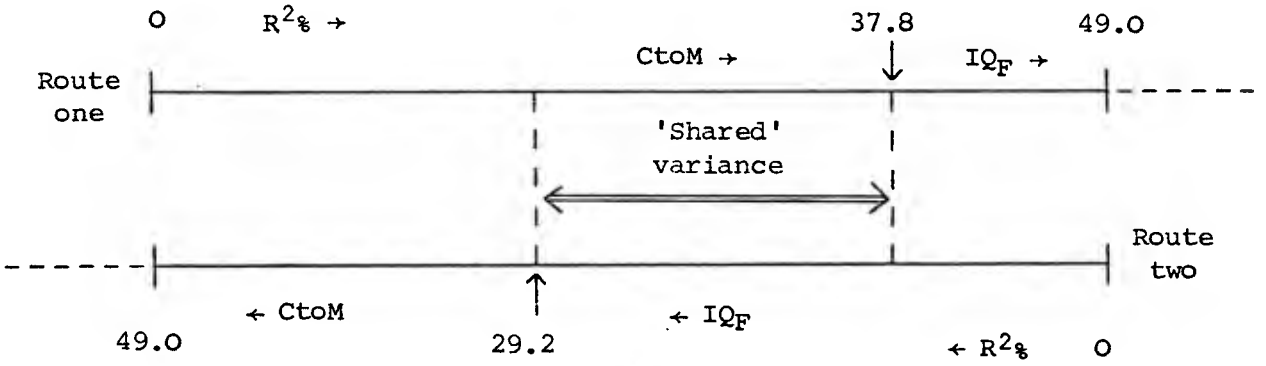


Fig. 60. Diagrammatic illustration of variance decomposition involving 'shared' variance.

The first and most essential point of interpretation is that, no matter which way the analysis is performed, both IQ_F and 'CtoM' have highly significant contributions to make to the explanation of variance in reading attainment. Difficulty only arises when a more precise estimate of relative contributions is required, since the two R^2 tables presented above would suggest different answers, while a third answer would follow from analysis of the

regression equation. As described in an earlier section, the problem is one of deciding which variable should be 'given the credit' for the 'shared' variance. The first R^2 table gives it to CtoM, the second to IQ_F. The F-tests on the equation give it to neither, i.e., the reported F-values of 37.7 and 21.2 for CtoM and IQ_F respectively (each with 1,97 df) are assessing the contribution of each variable over and beyond that made by the other. Neither gets credit for the sums of squares explained by their shared pathway.

According to the three different methods then, the overall R^2 of 49.0% may be broken down as follows :

Method 1 Free regression. 'CtoM' enters before IQ_F. Reference is R^2 table.

49.0%	=	37.8%	+	11.2%
Variance explained by both predictors		Increment due to CtoM		Increment due to IQ_F

Method 2 Forced regression. IQ_F enters first. Reference R^2 table.

49.0%	=	29.2%	+	19.8%
Variance explained by both predictors		Increment due to IQ_F		Increment due to CtoM

Method 3 Each variable treated as though were added last.

49.0%	=	11.2%	+	19.8%	+	18.0%
Variance explained by both predictors		Increment due to IQ_F		Increment due to CtoM		Not attributed to either CtoM or IQ_F

The point has been stressed because 18.0% of variance explained is a very substantial amount, and its attribution to one variable or another makes a difference large enough to be of interpretative significance.

Performing a traditional analysis of attainment data using IQ as a covariate is equivalent to Method 2 above, i.e., a generous estimate is made of the contribution of the covariate, and a conservative one of any other factor.

It is believed here that this approach is misleading, since the ambiguity of the situation is never revealed, and no justification need therefore be given for assigning shared variance to the covariate rather than any other factor, or even not assigning it at all.

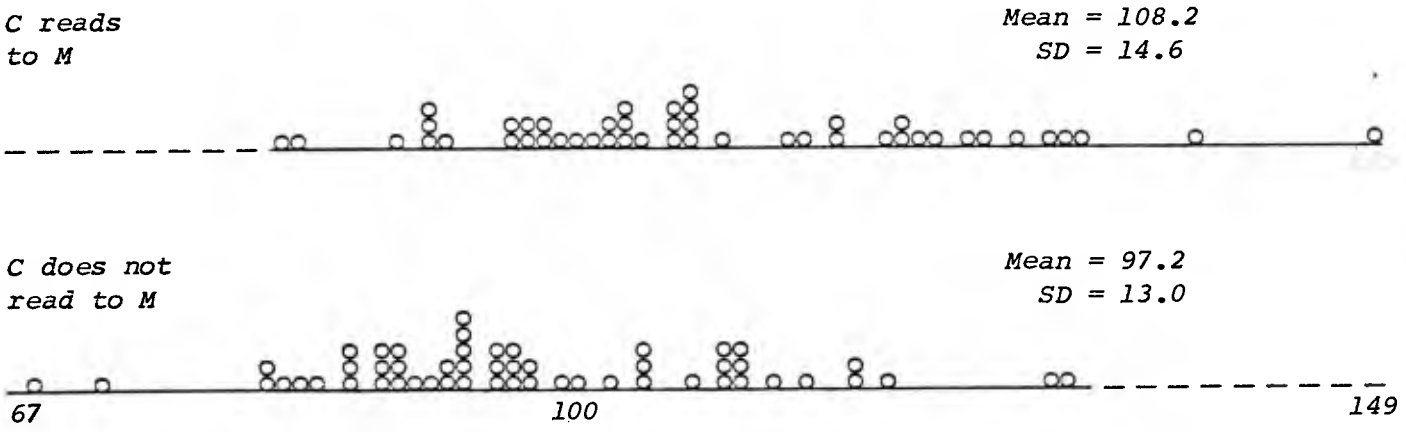
Assigning shared variance

It was stated earlier that the two reasons usually given for assigning shared variance are 'causal priority' or 'prior chronology of impact.' Judgements - implicit or explicit - about the nature of the link between the two independent variables are also usually involved.

Because this 'overlap' between the predictors - i.e., the extent of their inter-correlation - was of central importance in the present discussion, its characteristics were investigated in more detail before the 'assignment of variance' issue was pursued further.

The relationship between help with reading ('CtoM') and IQ_F

When a stratified histogram was plotted of IQ_F score by 'CtoM,' (See Figure 61) children whose mothers listened to them read were found to have a higher group mean IQ.



F = 16.0 with 1,98 df. p < .0001

Figure 61. Full Scale IQ by Child reads to mother

The difference between the means was 11 IQ points, which was highly significant statistically. (F = 16.04 with 1,98 df. p < .0001)

The regression analyses presented above have already demonstrated that, even allowing for this IQ difference, the effect of being helped with reading was still very substantial. This may also be demonstrated in a more obvious way, by looking at groups of children, banded for IQ, and seeing if the effect of being helped holds up within each group. (Table 68)

Table 68

The relationship between 'child reads to mother' and reading performance in groups of children banded for IQ

N = 100 Mean reading score = 94.2 Mean IQ = 102.4

IQ band	Child reads to mother	Reading score: 95 or above ('Good')	Reading score: 94 or below ('Poor')	
87 or below	Yes	1	1	2
	No	0	10	10
88 to 102	Yes	10	6	16
	No	5	21	26
103 to 117	Yes	14	2	16
	No	3	9	12
118 or above	Yes	11	2	13
	No	1	4	5

First and foremost, the effect of being helped with reading is observable at all IQ levels. Secondly, the higher the IQ band, the higher the proportion of children who were found to be receiving help with reading. It was as a result of this second fact that there was so much 'shared' variance between IQ_F and 'CtoM' in the reading analysis.

For interpretative purposes, the problem was now seen to fall into two parts. Firstly, it was necessary to think about possible reasons for the association between help with reading and IQ, and secondly, to follow through the various possibilities in terms of their implications for the assignment of shared variance.

The role of IQ in analyses of attainment

According to traditional models of the determination of attainment, IQ measures the quality of the input to environmental processes. In the present study, for example, in order to assess the merits of a particular environmental feature, such as receiving help with reading, it is first necessary to compare the quality of the input to the 'help' and 'no help' situations, and then to allow for differences found when evaluating the effect of the 'help' factor.

On this model, as on any other, a significant difference in input to the two groups should be explained, not just 'allowed for.' Possible explanations compatible with the underlying premises would be: that more intelligent mothers have both more intelligent children, and also more beneficial child-rearing practices; that intelligent children are more demanding of mothers' time and interest; that mothers take an increased interest in the progress of intelligent children.

If IQ is seen as input, it follows that both prior 'chronology of impact' and causal priority must be attributed to it, the latter in the sense that it was high IQ which led to, i.e. caused, help to be given with reading. On this model then, shared variance must be attributed to IQ, as well as its unique contribution, and environmental influences are assessed strictly in terms of what explanatory power they add, over and beyond that provided by IQ.

Less traditional models reject the notion of IQ as a fixed input characteristic, and concede that, to an unknown extent, IQ as measured is modifiable by environmental forces. In other words, these models would see the 'help with reading'/IQ

link as being caused by forces acting in the opposite direction to those previously suggested. In terms of the present study, the most likely explanation of the observed link would be that the kind of interested, involved attitudes to the bringing up of children, which lead a mother to offer help with reading, also succeed in fostering the kind of general cognitive development which is tapped and assessed by an IQ test. Other mechanisms might be involved also. For example, very little is known about the influence of reading on IQ, rather than the other way round. Good readers might have acquired information-processing skills which serve them well on an IQ test, or it may be that good readers read more about all kinds of things, and that this incidental knowledge is of assistance in some types of IQ subtest.

This discussion is taken up again in Chapter 6.

The 'IQ as modifiable' model has important implications for the partitioning of variance problem. If it is the case that common environmental factors influence reading level and IQ (albeit to different extents,) or that reading level has a feedback effect on IQ, then partialling out the relationship between IQ and reading necessarily reduces the strength of the connection between the environmental factor and reading. In fact, what the 'adjusted' environmental factor/reading correlation measures is the influence of the environment on reading, over and beyond its influence on IQ. While the environmental factor is being underestimated in this way, the effect of IQ on reading is being overestimated - since IQ and reading share a common determinant, the IQ/reading correlation will be artificially inflated. Even on this model, however, attribution of shared variance

to the environmental component could not fully be justified unless all the predictor overlap could be explained in these terms.

It is the opinion of the present writer that it is not possible to make a rational choice from amongst these alternatives on the basis of the evidence that exists at present. In all likelihood, a mixture of processes is taking place, in which case, neither predictor could ever be said to be wholly responsible for the shared variance. Since it is not possible to divide up the shared component - 18% of the total criterion variation in the present analysis - the only alternative is to accept the three-way breakdown of variance explained, rather than continue the search for a two-way division. In other words, the interpretation which is to be placed on the two-predictor analysis of the reading data is a cautious one. Access to both IQ scores and information on the help given with reading enables 49% of the variance in reading scores to be accounted for. Of this 49%, about 11% is uniquely contributed by IQ, and about 20% is uniquely contributed by the 'help with reading' variable. The remaining 18% of variance which was explained by the two predictors taken jointly may not be attributed to either single predictor.

Interaction between IQ and help with reading

It is important to realise that the discussion of 'shared variance' in the sections above was not referring to interaction variance as that term is commonly used in the analysis of variance.

Shared variance arises when, in conventional Anova terms,

the main effects are non-orthogonal, i.e., levels on one factor are not distributed evenly over levels on another. In these circumstances, it is not possible to estimate the main effects independently of one another, and the unique factor contributions do not add to equal the combined main effects contribution.

Interaction variance, however, refers to the additional effect on the criterion of particular combinations of factor levels, i.e., it is information over and beyond that provided by the main effects, rather than a particular portion of the main effects contribution itself.

In the present study, for reasons already explained (see page 305) a full investigation of all the interaction effects arising from the study variables was not carried out. Since, however, the relationship between IQ and 'help with reading,' as predictors of attainment, was proving particularly interesting, it was decided briefly to examine the interaction between the two variables.

Firstly, the correlation between IQ_F and reading score was calculated separately for the 'help' and 'no help' groups. The results were as follows:

'Helped with reading' group (N = 47): r = 0.57 (p = .001)

'Not helped' group (N = 53) : r = 0.23 (p = .046)

This suggests that, for children who receive help, how well they read depends to a very significant extent on their IQ. In the case of children who do not receive help, however, knowledge of their IQ is of comparatively little use in predicting how well they can read. Put another way, children who are not helped with reading are, on the whole, poor readers whatever their IQ, whereas amongst children who

receive help, IQ plays an important part in determining the level of their success.

Turning the question of interaction the other way round, it may be asked, does providing help with reading have more effect on the attainment of high IQ children? Figure 62 below provides a very crude answer to this question. Mean reading scores were computed for children of above - and below - average IQ (i.e., distribution dichotomised at the mean of 102.4) who did and did not receive help with reading. The four means are given in Table 69 below, and plotted in sketch graph form in Figure 62.

Table 69

Mean reading score of high and low IQ children helped or not helped with their reading

	No help	Help
High IQ	88.4 (N = 17)	105.3 (N = 29)
Low IQ	87.2 (N = 36)	95.7 (N = 18)

Overall mean R score = 94.2.

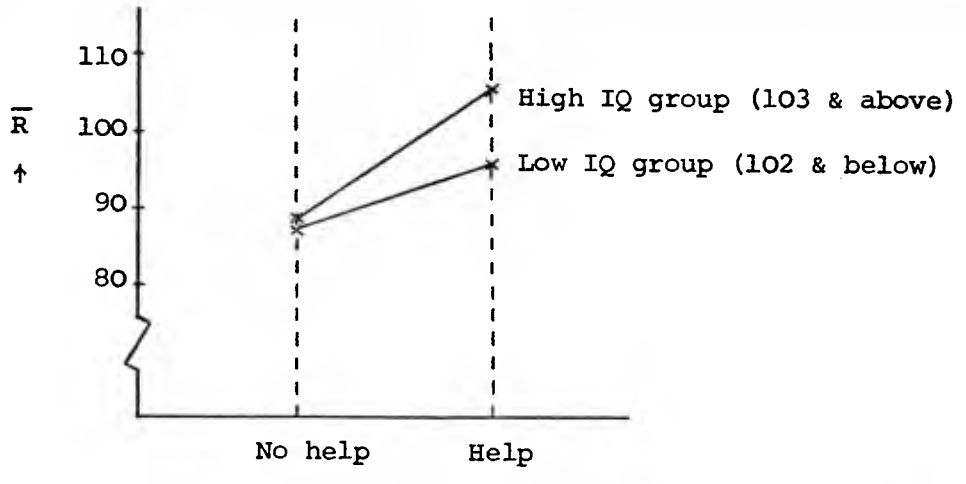


Figure 62 Mean reading score of high and low IQ children, helped or not helped with their reading.

Receiving help with reading did appear to have a greater effect on children whose IQ was above average. The most striking fact to be shown by the graph, however, was that both high and low IQ children who received no help with reading were performing at a remarkably uniform, low, level. It appears that above average IQ, per se, is no guarantee of success in reading in the present study sample.

A number of further analyses were performed on the IQ data - examination of verbal and performance subscales, correlation with the Bernstein scales, and so on. The section after next takes up this account. The section immediately following considers the interpretation of the analyses so far.

Home Background Variables as Predictors of Achievement: Supplementary Analyses

A full regression analysis, while representing the most efficient treatment of the data from a statistical point of view, does not necessarily produce results which are readily interpretable as answers to particular psychological questions. This was found to be the case when interest was focused on the relative contributions of IQ and 'direct help' to reading attainment.

Other specific questions asked at the beginning of the present study were:

1. Do the child-rearing variables, which were found in the pilot to be predictors of attainment, hold up as such on new data? The two types of help with reading, and the child-rearing inventory, were of particular interest here.
2. Are scores on the Bernstein scales as useful at predicting reading attainment in the present sample as they were in Bernstein's West Ham sample?
3. In the pilot, it was found that much of the apparent effect of aspirations, mother's reading model, and mother's language behaviour on reading attainment was 'explained' by their association with a more powerful predictor, namely direct help given with reading. Were these conclusions borne out in the junior school data?
4. Is either of the two types of help with reading more effective than the other in raising attainment, or is there little to choose between them?
5. A social class gradient in achievement was found in the pilot study. This gradient was reduced when

allowance was made for the 'direct help' factor, and reduced still further when child-rearing inventory score was also taken into account. (After this second step, the class effect fell below statistical significance.) Was a similar pattern of effects found in the junior school data, and were social class differences in tested IQ also of relevance?

6. Was the educational level of mothers related to the reading attainment of their children, and if so, to what extent was the relationship mediated by the mother's child-rearing practices?

This short section is designed to use the results so far, together with supplementary analyses, to provide answers to these specific questions.

Child-rearing variables as predictors of reading attainment

Consulting first the table of simple bivariate correlation coefficients given on page 299 , the following coefficients are most relevant.

(N = 100 sample figures. Significance level of each coefficient given beneath it.)

	CtoM	MtoC	Inventory Score	Modelling ('MtoM')	Asp	Social Class
NFER	0.62	0.27	0.43	0.09	0.18	-0.17
	(0.001)	(0.003)	(0.001)	(0.183)	(.037)	(0.049)

As in the pilot, the reading model provided by a mother was not related to her child's reading attainment. This is counter to prevailing theory about the importance of the 'cultural level' of a child's home.

Aspirations and social class both yielded low, but statistically significant, correlations with attainment.

The best predictors of reading success were, as before, indices of the actual behaviour of the mother towards her child, rather than expressed attitudes or other measures of a 'supportive' - but otherwise passive - home.

Of the two types of direct help with reading, the form in which the child takes the active role of reader, as opposed to listening while his mother reads to him, appears to have the greater influence on reading attainment. Since in the pilot study, it was not possible to separate out these two variables, it may be that this advantage for 'CtoM' was present then also, or it may be that it is not manifest until children reach junior school age. With the present data, it is not possible to resolve this issue.

A more detailed comparison of the two types of direct help is made in a later section of this chapter.

Score on the 'Child-rearing Inventory,' the measure developed in the pilot study, showed a stronger relationship with reading performance than any of the other predictors except 'child reads to mother.'

The Bernstein scales as predictors of reading attainment

The correlation coefficients obtained from the present study sample are compared in Table 70 below with those obtained by Bernstein's research team on their sample, also a working class one, and also of children between seven and eight years old. (Bernstein data from Brandis 1974, pers.comm.)

Table 70

Language behaviour and reading score: correlations obtained in the present study and by the Bernstein team

	Present Study (Dagenham) N = 100	Bernstein team (West Ham) N = 122	
Reading test:	NFER 'A'	Neale Acc.	Neale Comp.
'Chat' scale	0.23 (p = 0.011)	0.28	0.26
'AwkQs' scale	0.33 (p = 0.001)	0.32	0.32

The correlations are highly consistent with the findings of Bernstein's own team, and are both statistically significant. However, when compared to the coefficients shown in the section above, the Bernstein scale scores may be seen to be less powerful determinants of reading success than the 'child reads to mother' and 'child-rearing inventory' variables.

Overlap of predictors

The following correlation coefficients were of relevance here :

	Mother reads to child	Inventory Score	Reading model	Asp	Chat	AwkQs
Child reads to mother	0.30 (0.001)	0.37 (0.001)	0.15 (0.070)	0.34 (0.001)	0.31 (0.001)	0.35 (0.001)

(Probability level given in brackets beneath each coefficient.)

Since the relationships of the 'reading model' variable to both reading attainment and to 'help with reading' were both non-significant, this variable was dropped from further analyses.

The association of the other variables with the 'child reads to mother' variable was responsible for much of their apparent influence on reading attainment, as is demonstrated by the following table of partial correlation coefficients. (N = 100 figures.)

	MtoC	Inv.score	Asp	Chat	AwkQs
Correlation with NFER, partialling out CtoM.	0.12	0.28	-0.04	0.05	0.16
	(0.121)	(0.003)	(0.356)	(0.309)	(0.062)

(Probability level given in brackets beneath each coefficient)

When the effect of 'CtoM' was taken into account, the only correlation with reading to remain significant was that of the child-rearing inventory score. Two points must be made about this pattern of results. Firstly, the predictive power of the child-rearing inventory devised in the pilot held up on new data, and did so independently of the 'direct help' effect. Secondly, and of much greater theoretical significance, the bivariate relationship of the Bernstein scales to reading score appears to be strongly dependent on the overlap of these variables with 'child reads to mother.'

If the above findings are correct, and the obtained correlations between mother's language behaviour and attainment are in fact 'borrowing' significance from another, more powerful, predictor of reading ability, then this throws doubt on the validity of those theories of educational disadvantage which state that inadequate language skills are the main cause of poor school performance in working class children.

Since the comparison between direct help with reading and mother's language behaviour as predictors of attainment

was a theoretically important one, it was pursued in more detail. An analysis of variance presentation has been used, on the grounds that it is likely to be more familiar, and hence more comprehensible, than a regression presentation. The statistical techniques underlying the two types of analysis are the same, and the same problem arises as to how 'shared' variance should be allocated.

In the terminology used by the SPSS Analysis of Variance program package, metric independent variables are all called 'covariates,' and non-metric ones 'main effects.' The program allows the user to choose whether 'main effects' or 'covariates' are assessed first, with in each case, the first-entered predictor being assessed directly (i.e., not controlling for any other variable,) and the second being assessed while controlling for the first. The analysis in the present case was run both ways. The first time round, the two Bernstein scales were entered first, and the effect of the 'help with reading' variable was assessed over and beyond their contribution to prediction. This corresponds to a 'traditional' Anova format, with covariates being assessed before main effects. The second run reversed this order of entry, i.e., the contribution of the language behaviour scales was assessed over and beyond that made by 'help with reading.' The two sets of results are presented in Tables 71 and 72.

With the Bernstein variables entering first, a highly significant covariate effect was observed, ($F=9.682, p<.001$); on close inspection, this was seen to be almost entirely due to the 'AwkQs' variable, the 'Chat' variable making only a very small contribution to the explained sums of

Table 71. Analysis of Variance: Reading score by Chat,AwkQs; CtoM

```
* * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * *
              NFERA    NFER A READING TEST SCORE
           BY CTOM     CHILD READS TO MOTHER
         WITH CHAT     CHAT SCALE SCORE
              AWKQS    AWKWARD QUESTIONS SCALE SCORE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                  SUM OF                    MEAN          SIGNIF
SOURCE OF VARIATION             SQUARES      DF           SQUARE      F    OF F

COVARIATES                     1590.813       2         795.407   9.682   .001
   CHAT                         180.908       1         180.908   2.202   .141
   AWKQS                        915.070       1         915.070  11.138   .001

MAIN EFFECTS                   3526.967       1        3526.967  42.931   .001
   CTOM                        3526.967       1        3526.967  42.931   .001

EXPLAINED                      5117.780       3        1705.927  20.765   .001

RESIDUAL                       7886.810      96          82.154

TOTAL                         13004.590      99         131.359
    100 CASES WERE PROCESSED.
      0 CASES (    0 PCT) WERE MISSING.
```

Table 72. Analysis of Variance: Reading score by CtoM; Chat,AwkQs

```
* * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * *
              NFERA    NFER A READING TEST SCORE
           BY CTOM     CHILD READS TO MOTHER
         WITH CHAT     CHAT SCALE SCORE
              AWKQS    AWKWARD QUESTIONS SCALE SCORE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                  SUM OF                    MEAN          SIGNIF
SOURCE OF VARIATION             SQUARES      DF           SQUARE      F    OF F

MAIN EFFECTS                   4921.358       1        4921.358  59.904   .001
   CTOM                        4921.358       1        4921.358  59.904   .001

COVARIATES                      196.423       2          98.211   1.195   .307
   CHAT                          .440       1            .440    .005   .942
   AWKQS                       175.562       1         175.562   2.137   .147

EXPLAINED                      5117.780       3        1705.927  20.765   .001

RESIDUAL                       7886.810      96          82.154

TOTAL                         13004.590      99         131.359
    100 CASES WERE PROCESSED.
      0 CASES (    0 PCT) WERE MISSING.
```

squares. The 'direct help' variable, entering second, still made by far the biggest contribution to explained variance.

When the 'direct help' variable entered first, the size of its contribution was, as expected, further increased. Entering second, the contribution of the Bernstein scales fell below the 0.05 level of significance, the 'Chat' variable in particular showing no trace of a unique contribution.

Taken together with the partial correlation coefficients on Page 345, these analyses indicate that the simple bivariate effect of the language behaviour scales on reading is, in large part, an artifact of their association with the 'direct help with reading' ('CtoM') variable. Conservative estimates of the contributions of these variables (i.e., assessed from their second-to-enter contributions) remain highly significant for the 'direct help with reading' variable, but fall below statistical significance for the Bernstein scales.

'Child reads to mother' and 'Mother reads to child' as predictors of reading attainment

This topic has already been referred to earlier in the chapter, when the possibility was raised of changes in practice having taken place since the pilot study. The regression analyses, and the partial correlation data already reported, revealed that 'Child reads to mother' was by far the more important of the two predictors in the junior school sample. Since the distinction between the two types of help is an important one in terms of schools' practices, and recommendations for parental involvement, it was decided that more understanding of the effects of the two variables would be valuable, so stratified histograms were plotted of

reading score by 'mother reads to child,' by 'child reads to mother,' and then by the two variables taken together, (Figures 63-65.)

Looking first at Figures 63 and 64, the contrast between the two groups on 'MtoC' was noticeably less marked than on 'CtoM.' Moving on to the two-way classification, because the number of children in the 'mother reads only' category was very small, it was not possible to draw more than tentative conclusions about them. As far as could be judged from the histogram, they appeared to fall somewhere between the group who had no help at all, and the large group, formed by taking all those children who did at least some of the reading themselves. Within this latter group, childrent who received both sorts of help were not at a noticeable advantage over those whose mothers never read to them. However, from the position of the 'mother reads only' group, it does appear that this form of help is better than nothing, even if much less effective at raising attainment than the 'child reads to mother' variety of assistance.

A two-way analysis of variance (Table 73) confirmed this impression, when it was found that the unique contribution of 'MtoC' was not statistically significant. A Multiple Classification Analysis provided more evidence along the same lines. (N.B. MCA procedures were described in Chapter 2.)

Other interpretations of the data are possible. It may be, for instance, that of the group of women who want to help, those whose children are amongst the lower attainers of the group are more likely to find that reading to their child is more appropriate to his performance level than letting him do the reading himself. It may be the case that, when their children transfer from the infants' to the junior school,

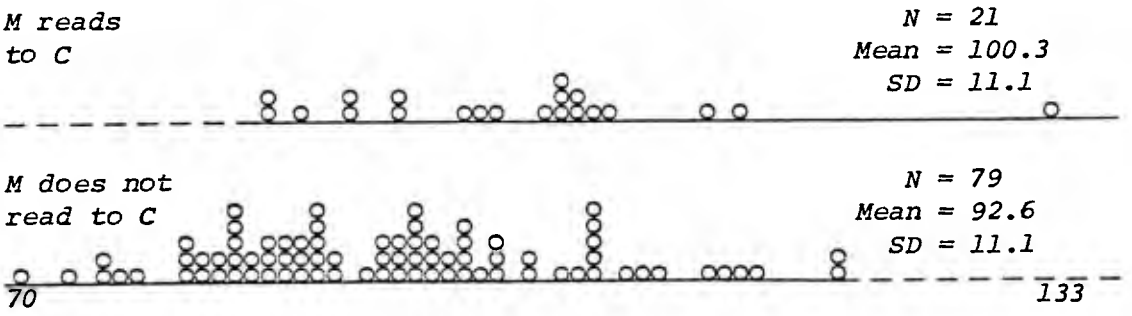


Figure 63. Reading score by Mother reads to child

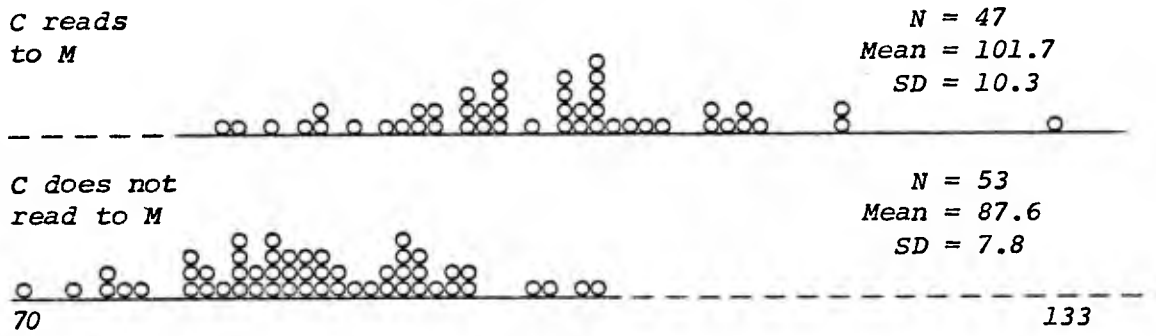


Figure 64. Reading score by Child reads to mother

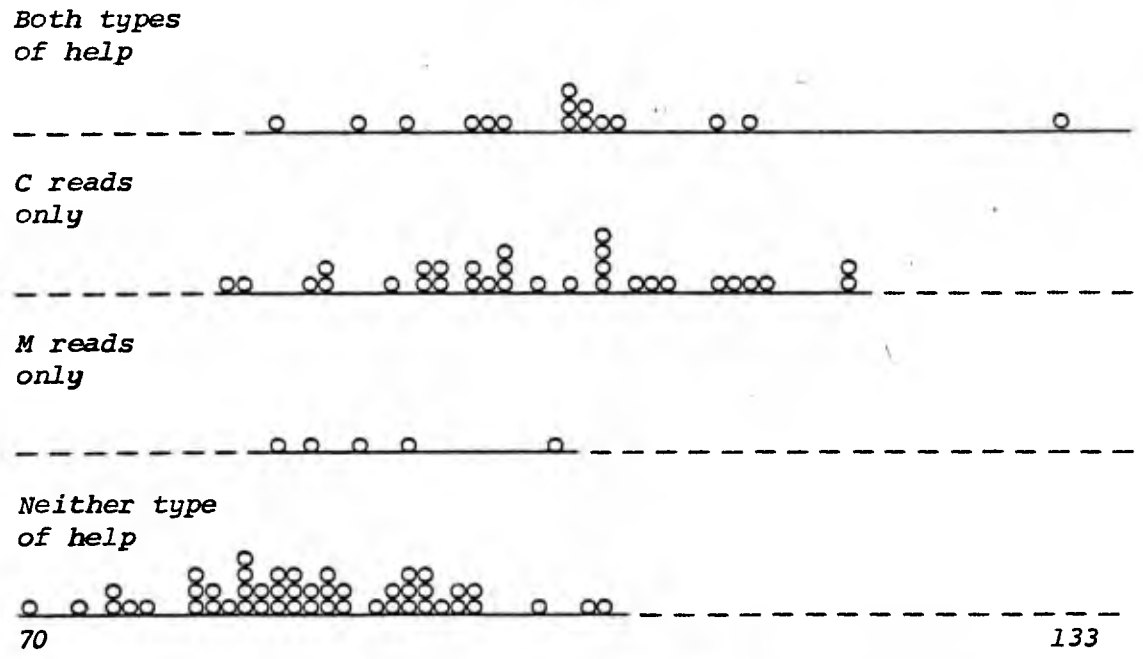


Figure 65. Two-way reading score histogram: CtoM x MtoC

Table 73. Analysis of Variance: Reading score by CtoM x MtoC

* * * * * * * * * * A N A L Y S I S O F V A R I A N C E * * * * * * * * * *

NFERA NFER A READING TEST SCORE
BY CTOM CHILD READS TO MOTHER
MTOC MOTHER READS TO CHILD

* *

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS	5035.158	2	2517.579	30.378	.001
CTOM	4053.891	1	4053.891	48.916	.001
MTOC	113.800	1	113.800	1.373	.244
2-WAY INTERACTIONS	13.507	1	13.507	.163	.687
CTOM MTOC	13.507	1	13.507	.163	.687
EXPLAINED	5048.665	3	1682.888	20.307	.001
RESIDUAL	7955.925	96	82.874		
TOTAL	13004.590	99	131.359		

100 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

* * * M U L T I P L E C L A S S I F I C A T I O N A N A L Y S I S * * *

NFERA NFER A READING TEST SCORE
BY CTOM CHILD READS TO MOTHER
MTOC MOTHER READS TO CHILD

* *

GRAND MEAN = 94.21

VARIABLE + CATEGORY	N	UNADJUSTED DEV'N	UNADJUSTED ETA	ADJUSTED FOR INDEPENDENTS DEV'N	ADJUSTED FOR INDEPENDENTS BETA	ADJUSTED FOR INDEPENDENTS + COVARIATES DEV'N	ADJUSTED FOR INDEPENDENTS + COVARIATES BETA
CTOM							
0 USED TO OR NEVER	53	-6.61		-6.29			
1 DOES STILL	47	7.45		7.09			
			.62		.59		
MTOC							
0 USED TO OR NEVER	79	-1.62		-.58			
1 DOES STILL	21	6.08		2.17			
			.27		.10		

MULTIPLE R SQUARED .387
MULTIPLE R .622

mothers of successful readers are more likely to take this as their cue to stop reading aloud themselves, than are mothers of less successful readers. Since no questions were asked in the present study about why a mother did a particular thing, the issue cannot be decided, and the data remain open to alternative interpretations.

The effect of social class on reading attainment

In the Pilot study, it appeared that some of the influence of social class on reading performance was exerted via links with the 'direct help with reading' variable, and with the behaviours tapped by the child-rearing inventory: 'adjusting' for direct help alone substantially reduced the class gradient, but did not eliminate it completely; adjusting for inventory score in addition reduced the class gradient still further, the remaining class effect falling below statistical significance.

In the present study, inspection of group means revealed that a social class gradient in reading achievement was present in the sample. As Table 74 shows, the fall-off in attainment was particularly marked at the non-manual/ manual boundary.

Table 74

Reading attainment by social class

Social class group	Mean NFER 'A' score	S.D.	N
III NM	99.9	12.0	10
III M	94.7	12.4	50
IV & V	91.8	9.9	27
No male head of household	93.0	9.6	13

In the regression analyses described earlier in this chapter, social class was coded as 'non-manual' versus 'the rest,' a coding system which happened to capitalise on the strongest contrast in the data. An Analysis of Variance carried out on the uncombined groups yielded a non-significant overall effect however. ($F = 1.30$ with 3,96 df. $p = .28$)

It was known from previous analyses (see Page 268) that in the present study sample, the social class groups did not differ significantly on any of the child-rearing measures, including inventory score and the 'child reads to mother' variable. In this respect, the present study sample did not resemble that of the Pilot. A one-way analysis of Full Scale IQ score by social class was also carried out on the present study data, and another non-significant result was obtained. ($F = 1.67$ with 3,96 df. $p = .18$)

It was concluded that the class effect on attainment could not be 'explained' by class differences on any of the predictor variables studied, a conclusion which was in agreement with the findings of the regression analysis reported earlier (Page 317.) In the circumstances, it was decided that applying complex multi-factor analysis of variance techniques to the data would not be justifiable. No further attempts were made to 'explain' the social class gradient in the present study sample, and the issue remained unresolved.

Mother's educational level, help with reading and reading attainment

As has been stated earlier, questions were not asked in

the present study about why a mother did the things she did with her child. As a general rule, the study was not concerned with the antecedents of particular child-rearing practices, beyond their association with family size, or social class, for example. One crude attempt was made, however, to establish a connection between a mother's own educational experiences, and her behaviour towards her child: this consisted of asking the mother when she had left school, and if she had any regrets about leaving when she did. It was planned to examine the relationship between this variable and the mother's child-rearing practices, and further, to see if the pattern of association extended to include the child's level of school performance.

When the four women who had stayed at school beyond the legal minimum were grouped with those who had regrets about leaving (see Page 297 for details,) and a crosstabulation constructed against the 'child reads to mother' variable, the following pattern was obtained. (Table 75).

Table 75

'Child reads to mother'

by mother's own experience of education

		'CtoM' No	'CtoM' Yes	
'Meduc'	No regrets about leaving	43	25	68
	Regrets about leaving	10	22	32
		53	47	

Corrected $\chi^2 = 7.70$ with 1 df. $p = .006$

In addition to the above, it was known that mother's educational level, as here defined, was significantly related to her child's reading achievement. (See table of

simple bivariate correlation coefficients on Page 299: point-biserial correlation of reading score with 'Mother's educational level' was -0.23, p = 0.012)

The question of interest, therefore, was whether the significant effect of 'Meduc' on reading was to some extent mediated by the 'child reads to mother' variable.

An analysis of variance was performed (Table 76) and revealed that the unique contribution of 'Meduc' after controlling for 'child reads to mother,' was very small indeed. The Multiple Classification Analysis which followed the Anova was particularly revealing in this instance. Adjusting for 'Meduc' reduced the 'CtoM' effect scarcely at all: when 'CtoM' was partialled out however, the 'Meduc' effect almost disappeared, the difference in means between the two 'Meduc' groups falling from about five and a half points to one point.

Since the effect of 'Meduc' had been explained in such large part by its association with 'Child reads to mother,' it was not considered worthwhile to pursue the analysis using other child-rearing variables as well. The analyses described so far may be summarized as follows:

mother's educational level is a simple bivariate predictor of children's reading attainment; it is also associated with the practice of hearing children read; the influence of mother's educational level on attainment seems to be exerted largely by its influence on the probability that the mother will listen to her child read.

Table 76. Analysis of Variance: Reading score by CtoM x Meduc

* * * * * * * * * * A N A L Y S I S O F V A R I A N C E * * * * * * * * * *

NFERA NFER A READING TEST SCORE
BY CTOM CHILD READS TO MOTHER
MEDUC MOTHERS EDUCATION

* *

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS	4946.796	2	2473.398	29.468	.001
CTOM	4281.940	1	4281.940	51.015	.001
MEDUC	25.439	1	25.439	.303	.583
2-WAY INTERACTIONS	.011	1	.011	.000	.991
CTOM MEDUC	.011	1	.011	.000	.991
EXPLAINED	4946.807	3	1648.936	19.645	.001
RESIDUAL	8057.783	96	83.935		
TOTAL	13004.590	99	131.359		

100 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

* * * M U L T I P L E C L A S S I F I C A T I O N A N A L Y S I S * * *

NFERA NFER A READING TEST SCORE
BY CTOM CHILD READS TO MOTHER
MEDUC MOTHERS EDUCATION

* *

GRAND MEAN = 94.21

VARIABLE + CATEGORY	N	UNADJUSTED DEV'N	UNADJUSTED ETA	ADJUSTED FOR INDEPENDENTS DEV'N	ADJUSTED FOR INDEPENDENTS BETA	ADJUSTED FOR INDEPENDENTS + COVARIATES DEV'N	ADJUSTED FOR INDEPENDENTS + COVARIATES BETA
CTOM							
0 USED TO OR NEVER	53	-6.61		-6.46			
1 DOES STILL	47	7.45		7.28			
			.62		.60		
MEDUC							
2 LEFT WITH REGRET	32	3.76		.77			
3 NO REGRETS	68	-1.77		-.36			
			.23		.05		

MULTIPLE R SQUARED .380
MULTIPLE R .617

IQ and Reading Attainment - Further Analyses

The topics covered in this section are as follows:

(a) Verbal and Performance subscales of the WISC compared to Full Scale score as predictors of reading.

(b) The relationship of 'child reads to mother' to Verbal and Performance subscale scores.

(c) Subtest patterns and their relationship to 'child reads to mother,' and to reading ability.

(d) IQ as a dependent variable.

(e) Short WISC and chronological age as predictors of reading attainment - reference to the work of Yule and associates.

(f) IQ and Bernstein scale scores.

*** *** *** *** *** *** ***

(a) Verbal and Performance Subscales of WISC in regression analyses

To recap, in the present sample, mean scores for the three WISC scales were found to be as follows :

		Verbal	Performance	Full
N = 100	Mean	101.6	102.9	102.4
	S.D.	16.5	13.7	14.8

When the three scores were correlated with NFER reading test score, the following coefficients were obtained:

	Verbal	Performance	Full
NFER reading score	0.49	0.46	0.54

All three coefficients were significant at the .001 level.

In the literature on the determinants of reading ability, much is made of the distinction betwen the Verbal and Performance IQ scales. In order to test if the conclusions arrived

at in an earlier section concerning Full IQ could be generalised to both its component subscales, the following four regressions were carried out:

(i) Verbal IQ and 'child reads to mother' - free, then forced.

(ii) Performance IQ and 'child reads to mother' - free, then forced.

Table 77 summarizes the results obtained, and also gives the Full IQ solutions for comparison purposes.

Table 77

Regression Analyses

'Child reads to mother' plus IQ_F or IQ_V or IQ_P as predictors of reading attainment

1. R^2 tables

Regression	Full IQ	R^2%	Verb IQ	R^2%	PerfIQ	R^2%
Free	'CtoM'	37.8	'CtoM'	37.8	'CtoM'	37.8
	IQ_F	49.0	IQ_V	46.0	IQ_P	46.7
Forced	IQ_F	29.2	IQ_V	24.0	IQ_P	21.6
	'CtoM'	49.0	'CtoM'	46.0	'CtoM'	46.7

2. Decomposition of R^2

IQ_F:	49.0% =	19.8% + 'CtoM'	11.2% + IQ_F	18.0% unattributed.
IQ_V:	46.0% =	22.1% + 'CtoM'	8.2% + IQ_V	15.7% unattributed.
IQ_P:	46.7% =	25.1% + 'CtoM'	8.9% + IQ_P	12.7% unattributed.

3. 'Normal' equations

IQ_F: $y_a = (0.48 \times Z'CtoM') + (0.36 \times ZIQ_F)$

IQ_V: $y_b = (0.50 \times Z'CtoM') + (0.31 \times ZIQ_V)$

IQ_P: $y_c = (0.52 \times Z'CtoM') + (0.31 \times ZIQ_P)$

The pattern of results for all three IQ measures - Verbal, Performance and Full Scale WISC - was found to be consistent. Most notably, Verbal IQ did not appear to have significantly more to contribute to the prediction of reading ability than did Performance IQ, this being demonstrated most clearly by the similarity of their unique contributions - 8.2% and 8.9% as shown in Table 77.

The Verbal/Performance IQ distinction is pursued further in the next section, so discussion of the above results has been postponed until then.

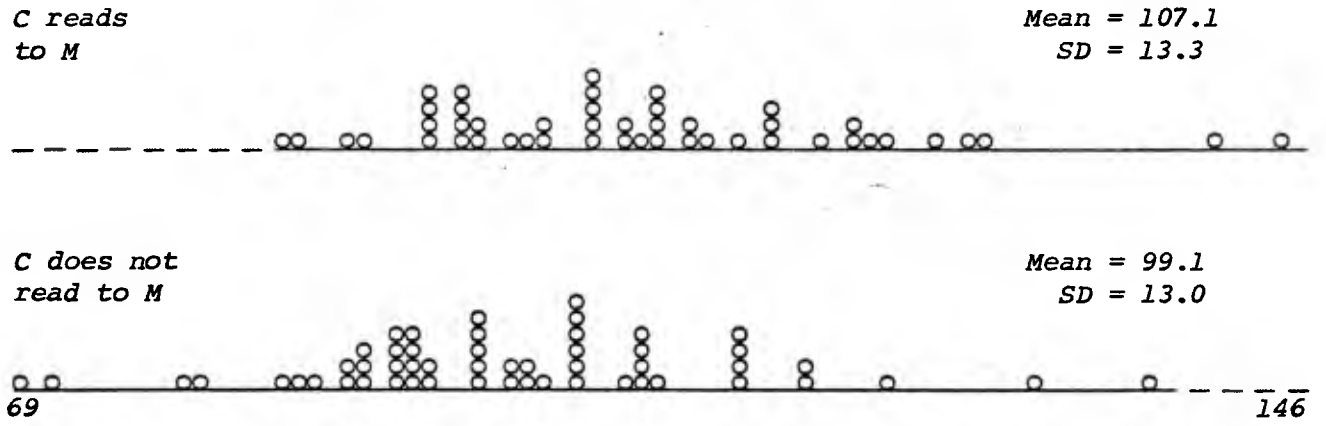
(b) The relationship of Verbal and Performance IQ to 'child reads to mother.'

As was previously shown for Full Scale WISC IQ, the regression analyses above demonstrate that 'child reads to mother' has a highly significant contribution to make to the prediction of reading attainment, over and beyond that provided by measures of Verbal or Performance IQ. The following discussion relates to the area of overlap of IQ and 'child reads to mother,' and in no sense calls into question each variable's established unique contribution to the prediction of attainment.

When stratified histograms were plotted of Verbal and Performance IQ by 'child reads to mother,' (Figures 66 and 67,) the group of children who received help with their reading was found to have a higher mean score on both measures. The difference between the two groups was smaller on the Performance than on the Verbal scale - 8 as opposed to 12 points - but was still significant at the .005 level. It was, therefore concluded that the relationship between Full Scale IQ

F = 14.8 with 1,98 df. p = .0002

Figure 66. Verbal IQ by Child reads to mother



F = 9.1 with 1,98 df. p = .0032

Figure 67. Performance IQ by Child reads to mother

and 'child reads to mother' was not solely dependent on some overlap of specifically verbal factors.

The discussion in an earlier section on possible reasons for the 'child reads to mother'/IQ overlap described the two extreme theoretical positions - IQ as a characteristic of the input to a set of environmental circumstances, and IQ as the end-product of such circumstances. On the 'input' model, group differences on Verbal or Performance scales are treated like differences on Full Scale IQ, i.e., described and 'allowed for,' rather than explained in any sense.

A version of the 'input' model, now quite widely used (see e.g., Ausubel & Robinson 69) distinguishes between Verbal and Performance IQ in the extent to which they are seen to be modifiable. Performance IQ is still effectively treated as a 'given,' but, in recognition of current theories about social class and language development which stem from the work of Bernstein, it is conceded that Verbal IQ may be influenced by the environment to an unknown extent.

What is of interest in the present study is that the environment, or particular aspects of it, may also be influencing Performance IQ, though to a lesser extent than Verbal IQ. In fact, the inter-relationships of reading ability, help with reading ('child reads to mother') and Verbal or Performance IQ are remarkable for their similarity rather than for any evidence of differences they provide.

As was stated earlier in the case of Full Scale IQ, the present data do not permit resolution of the controversy over the 'correct' model for IQ. What they do suggest is that the 'environmentalist' model, currently found acceptable for Verbal IQ, should be stretched to accommodate a

'modifiable' Performance IQ also. One implication of this suggestion is that studies using Performance IQ as a covariate in the analysis of attainment should be viewed with the same suspicion that led to the rejection of the 'culture dependent' Verbal IQ in the same role.

(c) Subtest patterns, and their relationship to reading and to 'child reads to mother.'

When Full Scale IQ was being considered, it was made plain that data of the present type do not permit conclusions to be drawn about causal connections amongst variables. Children who receive help with reading may have a high mean IQ because mothers who help also foster intellectual development; because helped children read better and reading affects IQ; because it is good readers who are more likely to be helped, and they became good readers because they had a high IQ; or because intelligent mothers have both intelligent children, and helpful child-rearing practices.

The same problem arises over interpreting Verbal and Performance IQ differences, and is magnified further when subtest patterns are being considered.

The theoretical position adopted here is a very eclectic one. In the absence of any conclusive evidence, and following the dictates of common sense, the inter-relationships of environmental factors (including help with reading,) IQ subtest scores and reading ability are envisaged as potentially two-way links in almost all cases. The balance of the 'flow' of causality in any one direction will, of course, vary from link to link, as will the overall strength of the association

between the variables so linked. For example, if subtest scores and reading skill are correlated, the 'connections' of some subtests with reading will be stronger than others, and further, the two-way character of the link will be more apparent in some cases than others: the skills indicated by high vocabulary and arithmetic subtest scores might both aid reading progress, but a differential 'feedback,' with reading skill improving vocabulary more than arithmetic, seems both reasonable and likely.

This model of a network of interacting variables underlies the discussion which follows. However, since some of the postulated 'causal pathways' are more controversial than others, they are discussed in detail at the expense of the more 'established' ideas. In particular, interpretations of the data stemming from a simple 'IQ as input' model are not spelled out in detail, since the arguments which applied to IQ scales apply also to subtests. Instead of saying that high IQ children become good readers, it can be said that children with a particular pattern of strengths and relative weaknesses on IQ subtests become good readers. No further 'explanation' is required.

It will be found, therefore, that attention is focused on 'IQ as modifiable.' This is not to be interpreted as signifying a particularly extreme environmentalist position, but rather as emphasising that alternative explanations can exist for even the most well-established educational 'facts' - for example, the causal link between 'ability' and 'attainment.'

The inter-relationships of 'child reads to mother,' IQ subtest scores and reading ability are presented in quantit-

ative terms in the section following, while discussion of the findings is to be found in the section after that.

Quantitative findings

When the inter-relationships of the variables were all calculated in correlation coefficient terms, Table 78 was produced. As may be seen, the rank order of the subtest correlations with the 'help' variable did not parallel their rank order with the reading measure at all closely. The coefficients are plotted in Figure 68 to illustrate this more clearly. As may be seen, the discrepancies in the pattern of correlations are much more marked for the verbal than for the performance subtests. Explanations of the 'high IQ leads to good reading ability and hence to help' variety are particularly strained by the verbal subtest results.

On the other hand, if IQ is indeed being modified by the environment, it is necessary to explain why the data provide evidence for the existence of home background/reading/IQ networks for some IQ subtests but not for others. The case of the arithmetic subtest is outstanding. Score on this test is a good predictor of reading, but help with reading at home is a very poor predictor of Arithmetic subtest score. On the other hand, Vocabulary subtest score is both a good predictor of reading ability, and is itself well predicted by the 'child reads to mother' variable.

The inter-relationships amongst the variables were clearly very complex. Numerical manipulations were not seen as helpful to the task of disentanglement since however precisely a relationship could be described in quantit-

Table 78. Correlation coefficients of WISC subtest scores with NFER 'A' reading score and with 'Child reads to mother'.

	INFO	COMP	ARITH	SIMIL	VOCAB	PICTCOMP	PICTARR	BLOCKS	OBJASS	CODING
NFERA	.4183	.2554	.4120	.4390	.3391	.3113	.3737	.3131	.2191	.3073
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .001	S= .005	S= .001	S= .001	S= .001	S= .001	S= .001	S= .001	S= .014	S= .001
CTOM	.2577	.2638	.1613	.3228	.3295	.1154	.2967	.2097	.1279	.1712
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .005	S= .004	S= .054	S= .001	S= .001	S= .127	S= .001	S= .018	S= .102	S= .044

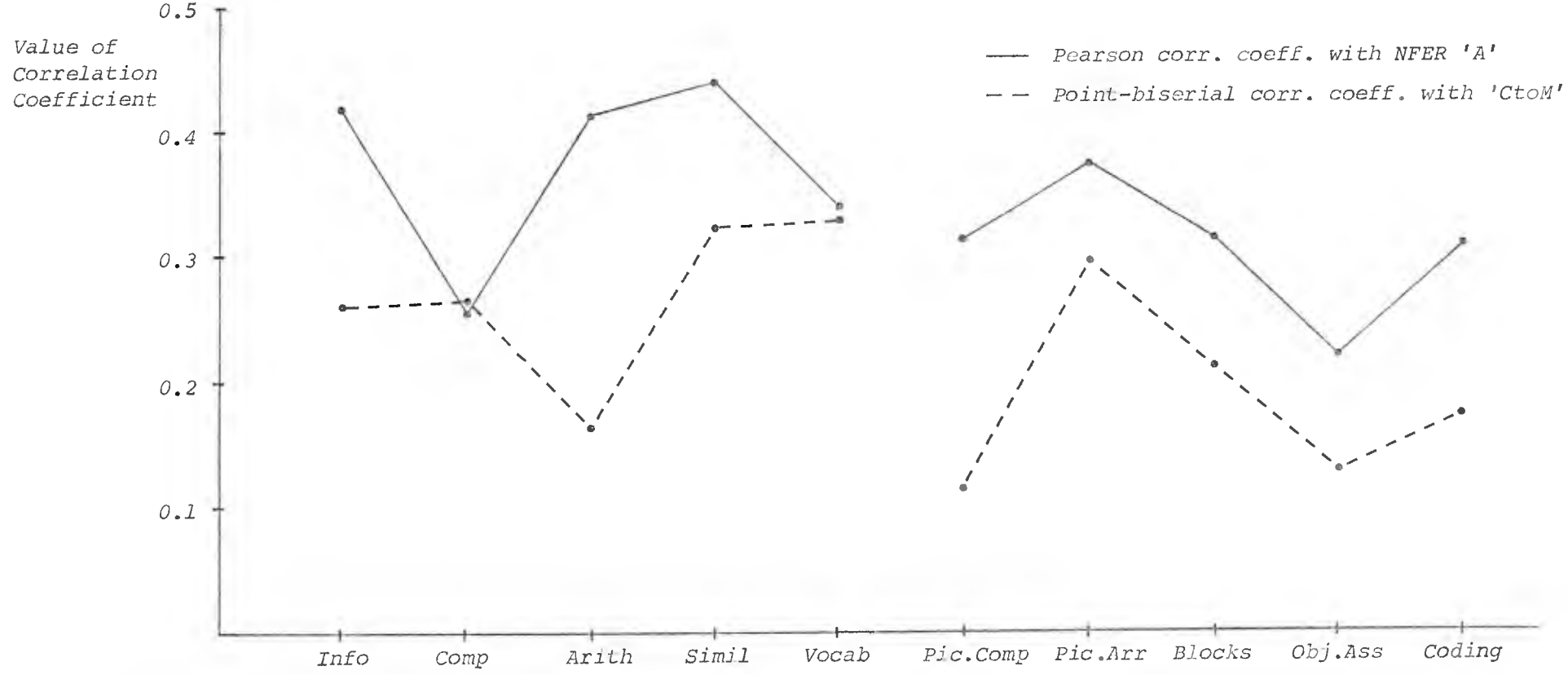


Figure 68. Correlation coefficients of WISC subtest scores with NFER 'A' reading score and with 'Child reads to mother'.

ative terms, ambiguity as to the direction of causality would still exist. The present study data simply could not provide answers to such questions. Further quantitative analysis on the present lines was, therefore, limited to computing certain partial correlation coefficients, which are presented in Table 79.

Table 79

Partial correlations of WISC subtest scores with reading score, after adjusting for 'child reads to mother.'

	NFER 'A'	(p level)	Bivariate coeffs. for comparison
Information	.34	(.001)	.42
Comprehension	.12	(.114)	.26
Arithmetic	.40	(.001)	.41
Similarities	.32	(.001)	.44
Vocabulary	.18	(.035)	.34
Picture Completion	.31	(.001)	.31
Picture Arrangement	.25	(.006)	.37
Block Design	.24	(.009)	.31
Object Assembly	.18	(.038)	.22
Coding	.26	(.005)	.31

The table reveals a differential reduction in the correlation coefficients of the various subtests with the NFER reading test, when the 'child reads to mother' variable is allowed for. As may be seen, the association of Arithmetic and Picture Completion with the reading score is independent of the 'child reads to mother' variable. All the other subtests are affected to some extent, the Performance subtests less so than the Verbal ones. General Comprehension and Vocabulary showed the most marked diminution

in their correlations with the reading test score, when the effect of 'child reads to mother' was allowed for.

Interpretation of the findings so far

In summary, what these analyses have established is the need for caution in interpreting WISC subtest data. Statements which can, with confidence, be made about the unique contribution of certain variables, notably the Arithmetic subtest score, to the prediction of attainment, may not necessarily be generalised to other subtests. The mechanisms underlying the association of 'child reads to mother,' vocabulary, and reading, for example, remain uncertain.

It has been stressed all along that firm interpretations in any theoretical direction are not permissible. Most of the discussion which follows is therefore frankly conjectural, being based on subjective assessments of plausibility, rather than anything more scientifically respectable.

The aspect of the data which seemed to offer potentially the greatest insight was the pattern of relationships of the subtest scores to 'child reads to mother.' Bringing reading ability into the picture added complexity but little else, since almost everything could be 'explained' under the umbrella of 'IQ as input,' i.e., children become good readers if they have a high IQ, or a high Verbal IQ, or a high Vocabulary score, or whatever other refinement is suggested. While this system works fairly well when describing good readers, describing children who receive help with their reading is a different matter. In order, therefore, to test the plausibility of 'IQ as input' theories in this

context, the subtest characteristics of children in the two 'help' categories were studied in more detail.

Subtest characteristics of children who did, and did not, receive help with their reading.

Table 80 summarizes the findings, which are also presented graphically in Figures 69 and 70.

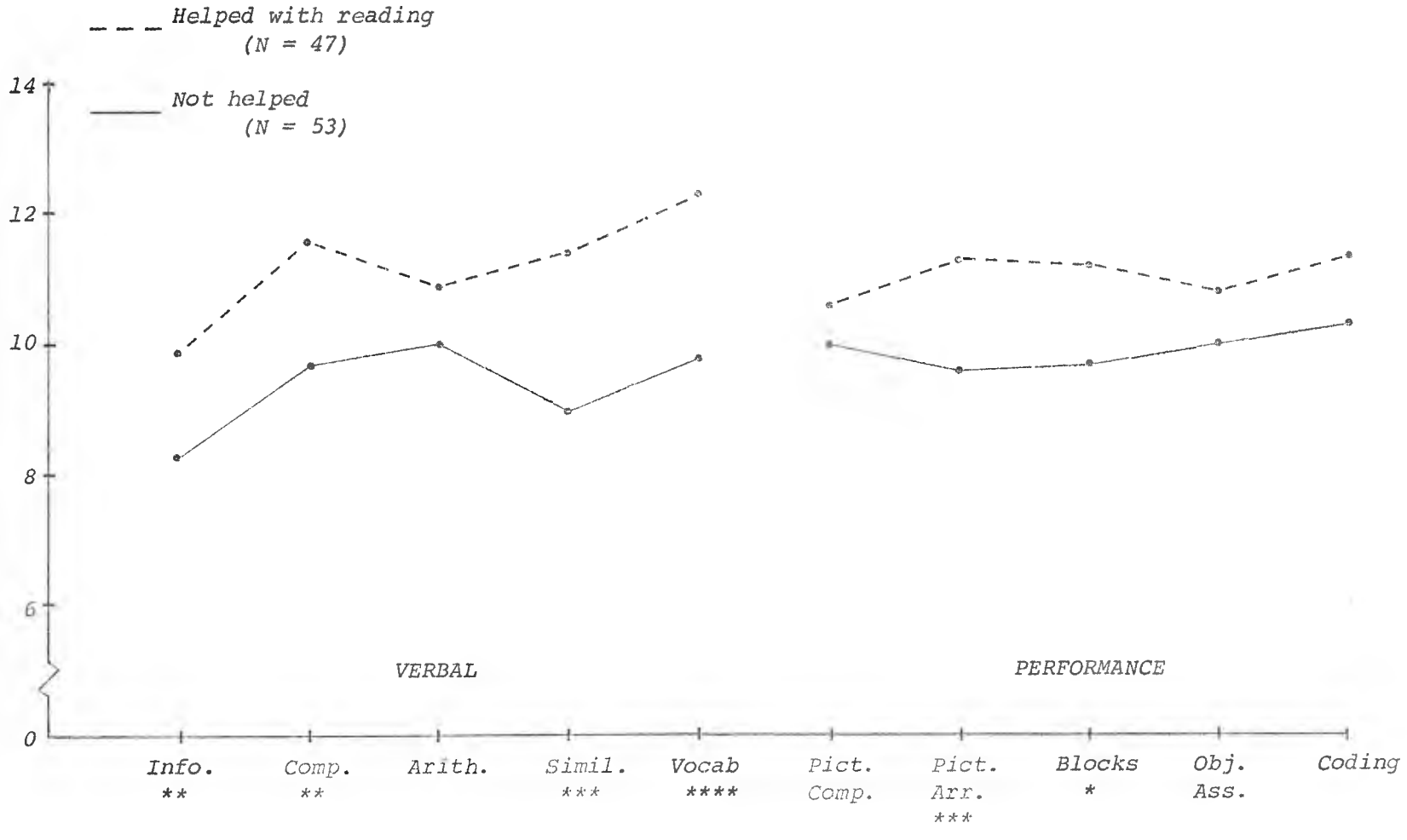
Table 80

WISC subtest characteristics of children who did, and did not receive help with their reading

	Group mean subtest scores		
	Help with reading (N=47)	No help (N=53)	Groups combined (N=100)
Information	9.9	8.3	9.0
Comprehension	11.6	9.7	10.6
Arithmetic	10.9	10.0*	10.4
Similarities	11.4	9.0	10.1
Vocabulary	12.3	9.8	11.0
Picture Completion	10.6	10.0*	10.3
Picture Arrangement	11.3	9.6	10.4
Block Design	11.2	9.7	10.4
Object Assembly	10.8	10.0*	10.4
Coding	11.3	10.3*	10.7
Overall mean	11.1	9.6	10.3

Although the group who received help with their reading obtained a higher mean score on all subtests, the differences between means was not statistically significant for four*of them. Three of these were performance subtests, and the fourth was the Arithmetic subtest on the Verbal scale.

A considerable literature exists on the significance



$p < .05$ *
$p < .01$ **
$p < .005$ ***
$p < .001$ ****

Figure 69. Mean WISC subtest scores of children who did, and did not, receive help with their reading.

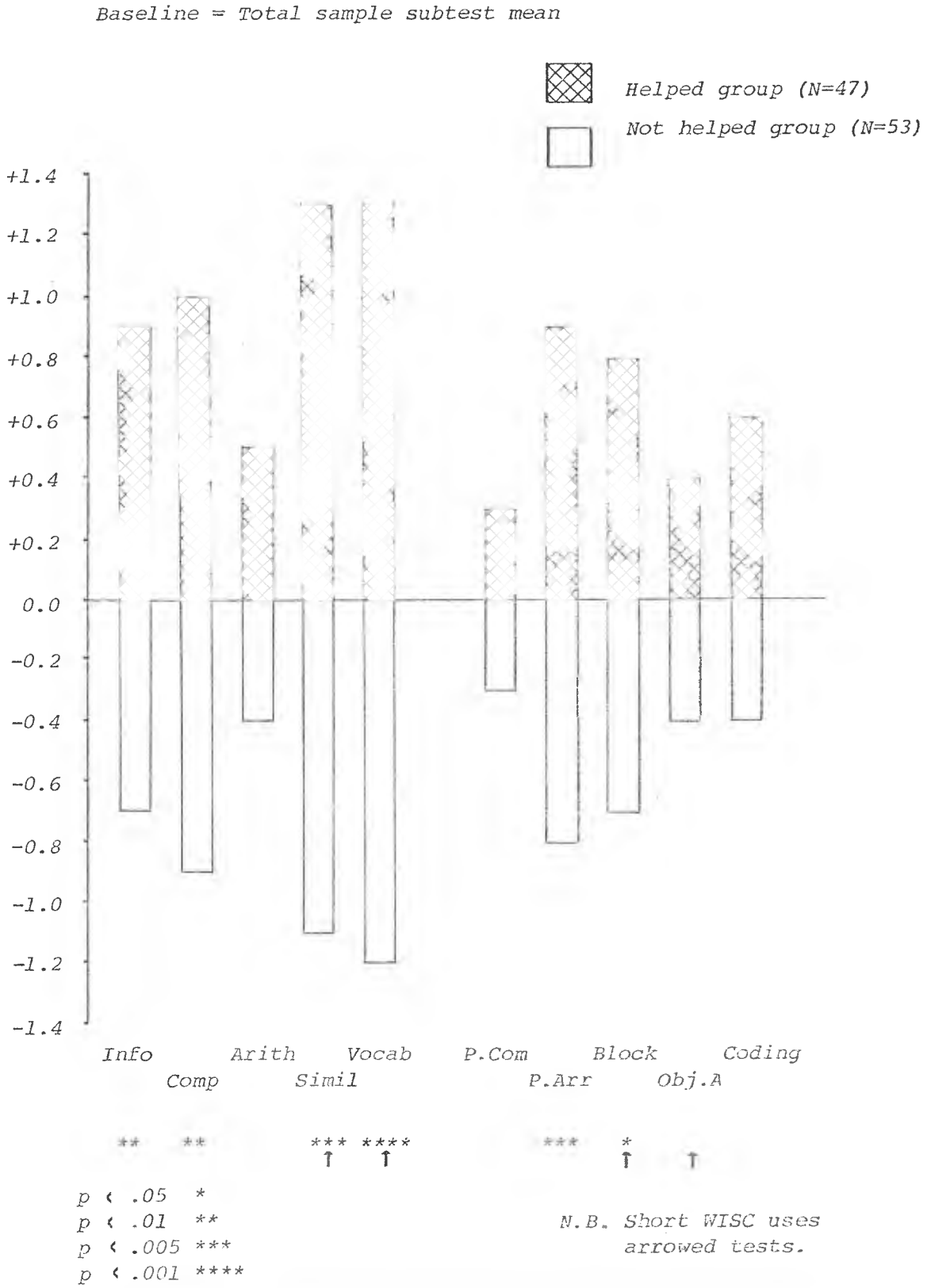


Figure 70. WISC subtests: subgroup means as deviations from total sample mean.

of the WISC subtest pattern, and its relation to backwardness in reading: detailed reference was made to it at this point, in order to aid the interpretation of the rather complex pattern found in the present study. Less assistance was gained than had been anticipated, however, since most studies went no further than the analysis above, i.e., they compared groups of children, usually retarded versus normal readers, on the various subtests, and listed any statistically significant differences found. (e.g. Huelsman 1970, Reid and Schoer 1966.) The paper by Belmont and Birch (1966) is an exception to this criticism. One of the methods described by the authors for examining group differences in WISC subtest profile was applied to the present study data. The method was graphic, and involved calculating relative deviations in subtest performance profiles between groups of normal and retarded readers. The first step was to establish a baseline, which consisted of "the deviations of each subtest score of the normal readers from the mean of their subtest scores;" - i.e., the zero shifts from subtest to subtest. The next step was to calculate the equivalent deviations for the groups of retarded readers, i.e., deviations from their own mean of subtest scores. Finally, the relative divergence of this latter group from the deviation of the control group, i.e., the normal readers, was plotted for each subtest. So, for example, "if the control deviated by +1.0 units from the mean of their subtest scores on a given subtest and the retarded readers by -1.0 on the same subtest, the retarded readers would be plotted as having a -2.0 deviation."

This somewhat complex procedure was applied to the present study data, using the children who did not receive

help with their reading as the baseline, or 'control' group, and plotting the relative divergencies of the 'helped' group from this base. The results are presented in Figure 71.

Belmont and Birch's comparison of normal and retarded readers produced a profile which was more straightforward than this one, in that the retarded readers performed especially badly on verbal subtests, and showed compensatory positive deviation on the performance subtests. In the present study, children who received help with their reading were at a striking advantage on the Similarities and Vocabulary subtests of the WISC Verbal scale, a lesser advantage on the Information and Comprehension tests of the Verbal scale, and on the Picture Arrangement test of the Performance scale, and showed relatively greater negative deviation on the remaining Performance tests, and on the Arithmetic test of the Verbal scale.

Thinking once again of interpreting this pattern on the various models of IQ previously discussed, if a version of the 'input' model is correct, a very precise differential selection process is taking place, so that children with a rather odd mixture of Verbal and Performance skills are somehow picked out to receive help with their reading. On the other hand, if it is the case that some variable associated with 'help with reading' is influencing IQ, then the subtest pattern is easier to understand. For example, it might be that the skills and knowledge tapped by the Similarities and Vocabulary subtests are developed more fully in children who are familiar with books, or whose reading attainment is high. Or it might be that mothers who, by whatever means, foster the reading progress of their children,

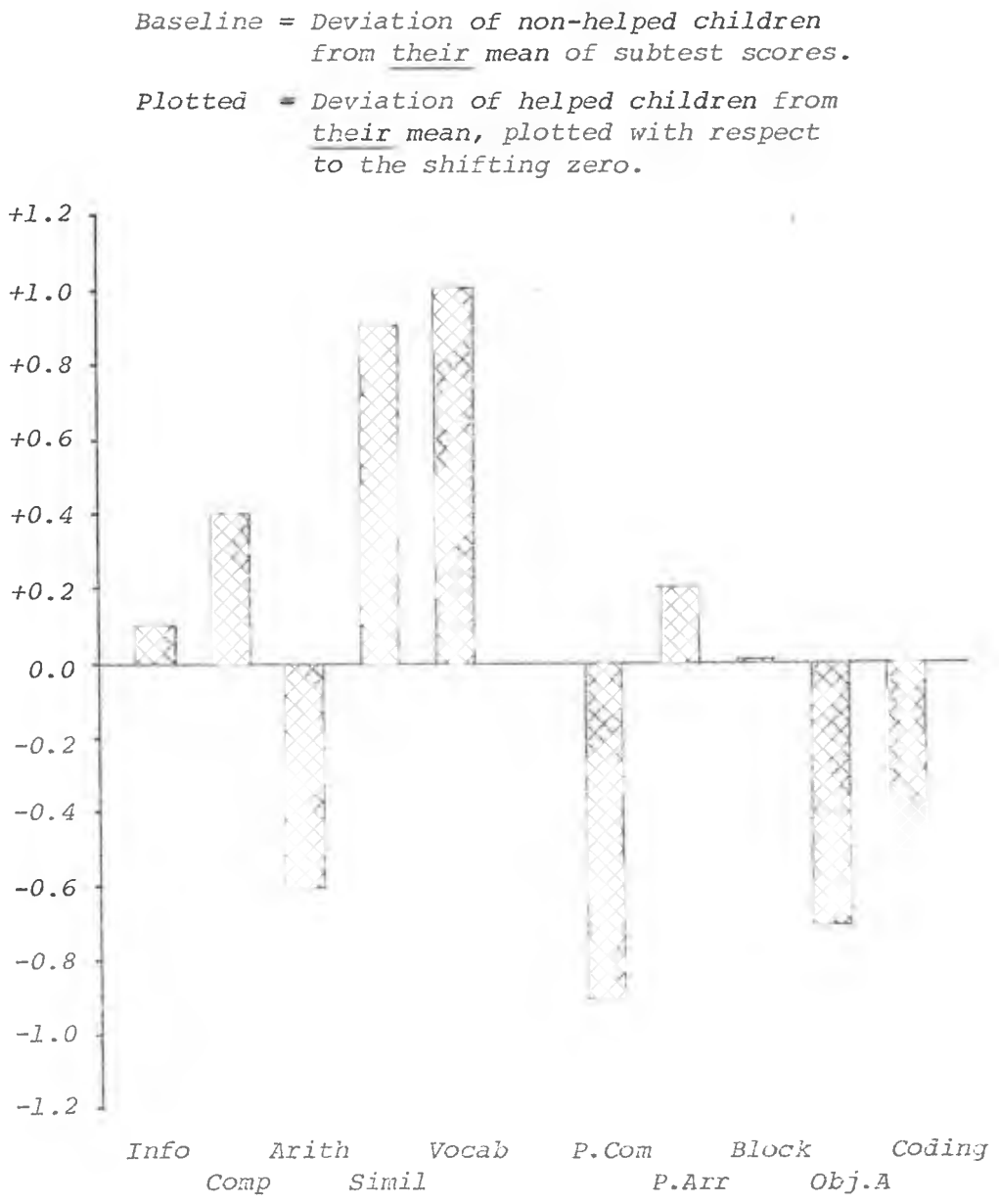


Figure 71. WISC subtest profiles of children who did, and did not, receive help with their reading, plotted according to the method of Belmont & Birch (1966).

also foster their linguistic and verbal development to a particularly marked extent. Even the discrepant Verbal and Performance subtests can be accounted for on this theory, admittedly in a very post hoc manner. The Picture Arrangement test, for example, might present an easier task for a child who was familiar with picture story books or comics, than for a child who was just beginning to use such material. The Arithmetic test, while belonging to the Verbal scale, clearly requires some non-verbal skills, and it is quite possible that a home which successfully fosters reading and related verbal skills does not place comparable emphasis on the development of number ability.

It is the opinion of the present writer that the data obtained here support an 'IQ as modifiable' model for at least some of the subtests of the WISC. On this model, general factors in the home influence both IQ and reading attainment. Further, reading receives extra support in the form of direct help with skill acquisition. Reading skill and IQ have, on this model, a reciprocal relationship with each other, with children who read widely and well scoring more highly on IQ tests, and higher IQ children progressing faster with the task of learning to read. The reading/IQ link would probably be much more important for some subtests than others.

The problems of testing this model are taken up in the discussion of IQ in Chapter 6.

Before moving on to the next topic, it is of interest to note that the subtest pattern obtained here, especially the 'Arithmetic' and 'Picture Arrangement' contributions, raises the question of the usefulness of the overall Verbal/Performance discrepancy commonly used in attainment studies, especially studies of reading achievement. At the very least, inspection of the subtest pattern before using Verbal and Performance IQ measures would seem to be a wise precaution against the accidental loss of valuable information. In the present study, having established that children who receive help with their reading showed a characteristic pattern of relative strengths and weaknesses on the WISC subtests, calculations were also performed, purely for comparison purposes, to see if they had an overall advantage on the Verbal scale, and further, if children with such an advantage were more successful readers.

Taking the second of these first, the IQ_V-IQ_P discrepancy was calculated for each child by simple subtraction, and the value obtained correlated with the child's reading score. To make comparison easier, the relationship between the discrepancy score and 'child reads to mother' was also calculated in correlation coefficient terms (the point-biserial coefficient.) The two results are given below.

N = 100		NFER reading score	Child reads to mother
	$IQ_V - IQ_P$	0.12	0.14
		(p = 0.114)	(p = 0.081)

An investigation using simple discrepancy scores would presumably have to stop at this point, since neither coefficient is statistically significant. It would be concluded

that neither good readers, nor children who are helped with their reading, are characterised by unusually high verbal IQ, and valuable insight into the processes at work would be lost.

Postscript: WISC subtest analysis using the method of Belmont and Birch

After the completion of the above analysis, the attention of the present writer was drawn to the perfect correlation which existed between the absolute values of the group differences on mean subtest scores, and the relative differences following the Belmont and Birch method of analysis. Because the Belmont and Birch method was somewhat complex, it was not immediately apparent why this should be so. It was decided, however, that the matter merited further investigation, because of the possibility it raised that the intricate Belmont and Birch method was in fact producing no more information than that obtainable from a simple ranking of group mean differences for the various subtests.

The method adopted was to represent the various stages in the Belmont and Birch analysis by algebraic expressions, in order to clarify the nature of the comparisons which were being made.

Using the present study data as an illustration, the process was as follows:

Let a_{1C} and a_{1N} be the means for subtest 1 of the groups who were helped with reading ('Coach') and not helped with reading ('No Coach') respectively.

Using the Belmont and Birch method of analysis, the position of the shifting baseline for subtest 1 is defined by,

$$(a_{1N} - \bar{a}_N)$$

For subtest 2, it is

$$(a_{2N} - \bar{a}_N) \quad \text{and so on.}$$

The equivalent deviations for the 'Coach' group are.

$$(a_{1C} - \bar{a}_C), \quad (a_{2C} - \bar{a}_C) \quad \text{and so on.}$$

Finally, the plotted relative divergence, y, may be represented by,

$$y_1 = (a_{1C} - \bar{a}_C) - (a_{1N} - \bar{a}_N) \quad \text{for subtest 1, and so on.}$$

This equation may be rearranged as follows,

$$y_1 = (a_{1C} - a_{1N}) - (\bar{a}_C - \bar{a}_N)$$

In this equation, the expression in the left-hand bracket $(a_{1C} - a_{1N})$, may be recognised as the absolute difference between the group means on subtest 1 (x_1). Since the expression in the right-hand bracket $(\bar{a}_C - \bar{a}_N)$, remains constant for each subtest calculation, the equation may be re-written as :

$$y_1 = x_1 - \text{(a constant)}$$

As well as revealing why values of x and y are perfectly correlated, this equation provides insight into what is actually being achieved by a Belmont and Birch type of analysis.

It may be seen that y_1, the plotted relative deviation value for subtest 1, is equal to the absolute group difference for subtest 1 (x_1), minus the overall group difference for all subtests. Considering all the subtests in turn, this amounts to establishing which of the absolute group differences are greater than the overall group difference, and which are less. Put another way, the overall

group advantage is composed of a mixture of some large and some small advantages (theoretically, of some disadvantages too, but as inspection of Figure 69 reveals, the 'Coach' group has a higher mean score than the 'No Coach' group on all subtests): the Belmont and Birch technique in effect analyses the composition of this overall advantage. In the present study data, for example, the overall advantage of the 'Coach' group is made up of large advantages on some subtests, e.g., Similarities and Vocabulary, and small ones on others, e.g., Arithmetic and Picture Completion. (Whether being helped with reading led to this pattern of advantages, or vice versa, has already been considered on Page 372.)

In their study of normal and retarded readers, Belmont and Birch interpreted their findings as showing that children with certain patterns of strengths and disabilities on the WISC tended to become poor readers. In terms of the 'flow' of causality, this interpretation may or may not be correct: in the opinion of the present writer, however, the unnecessary complexity of the analysis procedures used by these authors hinders appreciation of relationships in the data, and that this in turn hinders conceptual understanding of the processes at work.

(d) IQ as a dependent variable

If it were the case that home environment factors were acting to modify IQ, then the magnitude of the potential effect is of great interest. Table 81 below summarizes the results obtained from the present data if some measure of IQ is placed in a regression analysis as the dependent

variable, with various child-rearing practices as the predictors.

(Pool of predictors for each regression = 'CtoM,' Asp, Chat, AwkQs, inventory score.)

Table 81

Regression analyses: IQ measures as dependent variables

Dependent variable	Predictors which entered eqn. (in order)	Final multiple R	Final Multiple R^2
1. Full scale IQ	CtoM, Inven.score,Asp	0.48	23.5%
2. Verbal IQ	CtoM, Asp, Inven.score	0.44	19.0%
3. Performance IQ	Inven.score, Asp, CtoM	0.44	19.3%
4. Vocabulary subtest	CtoM, Asp	0.38	14.4%
5. Coding subtest	AwkQs, Asp	0.21	4.5% *

*Regression not significant.

The Vocabulary and Coding subtests were selected as good 'a priori' examples of a verbal and a performance skill respectively.

Once again, a strict 'environmentalist' position is not being argued here. The purpose of these analyses was rather to demonstrate that the theoretical debate is not being waged over a small effect. Knowledge of certain aspects of the child-rearing practices in a group of families, obtained by interviewing the mothers, enables a large proportion - nearly a quarter - of the variation in Full Scale IQ of the children from these families to be accounted for. The direction of causality in an effect of this magnitude is a non-trivial matter, with very substantial educational implications.

This section, and those immediately preceding it, have taken a clearly 'IQ as modifiable' stance. The section which

follows discusses current research which takes the opposite point of view, i.e., 'IQ as input,' to the processes of learning and attainment.

(e) Short WISC and chronological age as predictors of reading attainment - the work of Yule and associates

To quote from Yule (1967): "In assessing degree of reading retardation, it is not sufficient to consider merely the discrepancy between the child's chronological age and his reading age on some standard measure. It is desirable and necessary to consider also the child's intelligence."

Yule goes on to describe the use of a regression equation, with chronological age and an IQ measure as indepenent variables, to calculate a child's 'predicted' reading age on the Neale test. Discrepancies between this predicted value, and the child's measured reading age are then calculated. Performance of this exercise on a large scale permits the percentage of children in the population with varying degrees of "reading retardation" to be ascertained. To quote from Yule again, "Only future studies of children screened in this way will show where the line (i.e., how many months discrepancy between measured and predicted reading age) should be drawn in considering which children to select for remedial instruction."

In subsequent papers, discussion takes place on the differences between children who are "backward" in reading, and those who are "retarded." The criterion for backwardness is simply performance below some specified absolute level, whereas for retardation, the concept is of deviation from a level predicted on the basis of intelligence.

In the epidemiological study carried out on the Isle of Wight (Rutter et al 70) when the social class distribution of reading retardation was compared with that of intellectual retardation (indicated by an IQ score a specified amount below the age group average,) differences were found. Both types of retardation were uncommon in middle class children, but whereas intellectual retardation was more common in social classes IV and V than in social class IIIM, the reverse applied for reading retardation. No figures were given for reading backwardness. It has been argued (Rutter & Yule 75) that the unusual distribution of reading retardation (i.e., with a 'hump' in social class IIIM) is evidence for a specific reading disorder, perhaps akin to the so-called syndrome of 'dyslexia' but in a more sophisticated guise.

This topic is important and is discussed below.

(N.B. There is an unfortunate confusion of terminology in the Isle of Wight report, which is reflected in the above discussion. A distinction is made and preserved between reading backwardness and reading retardation. Only one expression is needed, however, to describe impaired intellectual functioning, and the authors chose 'intellectual retardation.' This is perhaps unfortunate, since the parallel with the concept of backwardness is the closer one, the low functioning group being defined by performance below some specified absolute level. In the remainder of this discussion, the term 'intellectual backwardness' will be used, but it should be remembered that a change of terminology has taken place from the original source.)

Meanwhile, returning to the original idea of predicting reading ability from a measure of IQ, it must be pointed out that, unless the 'IQ as input' model is correct, then Yule's recommendations for evaluating

achievement are at best misleading, and at worst, very damaging. To the extent that the 'IQ as input' model is wrong, i.e., that IQ scores might be depressed by the same or similar environmental factors that depress reading attainment, then Yule's system works in the direction of justifying the 'status quo.' Children from unfavourable environments will read badly, but if that same environment has also depressed their IQ, then their reading failure will cause less concern because it will be expected. If remedial teaching resources are scarce, then these children will not be selected, because they will be considered to be performing at the level 'set' by their low IQ.

Clearly, the above argument presents the extreme case. Since, however, it is accepted outside the context of this study that verbal IQ at least is influenced by environmental forces, then the process described above must be taking place to some extent. It is the magnitude of that extent, and its consequences in the practical terms of who gets and who is denied remedial teaching, which is a debatable issue. (If remedial teaching is at stake, there are many arguments for just giving it to the worst readers, i.e., worst in absolute terms, rather than denying it to any child because his poor performance is "expected.")

The present study was used to investigate, very briefly, some of the consequences of applying Yule's method, in terms of the possible bias which might be introduced into the "predicted" reading ability estimates, if the 'IQ as modifiable' model were the correct one.

As his measure of IQ, Yule used a short form of the WISC, consisting of the sum of the scale scores on the

Similarities, Vocabulary, Block Design and Object Assembly subtests. Reference to Figure 69 on Page 369 reveals that the first three of these showed significant differences in the present study between children who did and did not receive help with their reading.

The two 'help with reading' groups were, therefore, compared on overall Short IQ, (calculated as described above,) and the difference in scores was found to be highly significant statistically. The analysis is summarized in Table 82 below. The 'help with reading' factor, it was found, accounted for about 12% of the variation in Short IQ score in the present sample.

Table 82

Analysis of Variance: Short WISC IQ by 'CtoM'

	Mean	SD	N
Helped with reading	45.7	10.3	47
Not helped	38.5	9.3	53
Groups combined	41.9	10.4	100

$F = 13.41$ with 1,98 df. $p < .001$

Short WISC (i.e., the sum of the scale scores on the Similarities, Vocabulary, Block Design and Object Assembly subtests) was then used as the dependent variable in a regression analysis identical to that reported in the previous section. 'Child reads to mother,' 'Aspirations' and 'child rearing inventory score' entered the equation; the final multiple R was 0.44 and the multiple R^2 19.8%.

The extreme version of the 'IQ as modifiable' model was then carried through into the analysis of the reading data.

Yule used as his measure of reading attainment the Neale Analysis of Reading Ability. Since the Neale test is not age standardised, chronological age as well as IQ had to be included as a predictor of Neale score. Yule's equations for the two most important Neale scales were as follows:

Criterion	Multiple Regression Equation
Accuracy of reading (in months of reading age)	$\hat{y} = -3.87 + (0.93 \times \text{'IQ'}) + (0.68 \times \text{CA})$
Comprehension of reading (in months of reading age)	$\hat{y} = -23.44 + (1.15 \times \text{'IQ'}) + (0.79 \times \text{CA})$

Chronological age is measured in months, and 'IQ' is the short WISC described above. The equations are easy to interpret, since by feeding in chronological age in months, and short IQ, a predicted reading age is directly provided. As may be seen, the IQ measure makes an important contribution to prediction - two children of the same chronological age, but who differ by 10 points in short IQ, will have predicted reading accuracy ages 9.3 months apart, and predicted comprehension ages 11.5 months apart.

If, therefore, a child's IQ is being depressed by adverse environmental factors, the result will be an underestimate of the reading age expected for that child.

The present study data provides a means of estimating the effect on predicted reading ability of an environmentally depressed IQ. The regression analysis described earlier in this section, in which short IQ was predicted from environmental indices, yielded the following equation:

Estimated Short IQ (i.e. sum of scale scores) = 32.93 + (4.29 x 'CtoM') + (4.35 x Asp) + (1.02 x child-rearing inventory score)

If,for the sake of argument, causality is seen as all 'flowing' in one direction, i.e., from environment to IQ, then the 'effect' may be calculated of being in a home in which none of the above variables - 'CtoM,' Asp, or the practices tapped by the child-rearing inventory - are acting in the child's educational favour. If 'CtoM,' Asp, and inventory score all equal nought, then the last three terms in the above equation all vanish, and the child's estimated short IQ is about 33. If, on the other hand, 'CtoM' and Asp both equal one, and the maximum score of nine is recorded on the inventory, then the estimate of short IQ rises to 50.7. Two hypothetical children, having these IQs, would be assigned on the basis of Yule's equations accuracy reading ages which were about 16 months apart, and comprehension reading ages which were over 20 months apart.

This argument has been deliberately presented in its most extreme form. It is not being proposed here as a quantitative description of mechanisms as they actually operate, but rather, once again, as an exaggerated demonstration of the flaws which may be introduced when 'IQ as input' models are used for the analysis of attainment.

The two hypothetical children described above would also reflect their differing environments in their reading attainments. The effect of using the Yule equations is to increase the likelihood that the poor achievement of a disadvantaged child will be seen, not as underachievement, but

as somehow to be expected, on the basis of his low 'potential.'

Conjecturing still further, children in certain sorts of adverse environment will have their IQs depressed by a measurable amount; depending on the age of the child and the magnitude of the effect, his chances of being classified as either 'backward' or 'retarded' in reading will be altered. The lower the IQ a child has, the harder it is for him to be 'retarded' in reading, as opposed to just 'backward.' Yule's criterion of 'retardation' was attainment 28 months or more below the level predicted on the basis of age and short IQ - but the lower the IQ, the more predicted attainment will fall below chronological age, and hence the less likely it is that actual attainment will be 28 months or more behind that, especially if the child is himself only about 9 years old.

It is possible that certain aspects of the social class distribution of reading retardation are explicable on these lines. For instance, if children in social classes IV and V are more likely to experience the sort of adverse environment which depresses IQ, then, following the above argument, they are more likely to be classified as just educationally backward, rather than 'retarded.' If arguments for the existence of a specific reading disorder are to be based on distribution data such as that for social class, then it is necessary to ensure that the observed differences in incidence could not be adequately explained any other way. As far as could be ascertained, however, no attempt has been made to do this.

The argument above centred on an environmentally depressed IQ, and the effect it could have on incidence figures for reading retardation and reading backwardness. In fact, low IQ stemming from any cause would affect the actual incidence figures in the same way, i.e., it would decrease the number of children potentially classifiable as reading retarded. It was noted in the study referred to above (Rutter et al 70) that intellectual backwardness was most common in the lowest social groups. This must have affected the number of potentially "reading retarded" children, yet no account was taken of it in the discussion of the incidence figures which followed.

If IQ were truly a test of innate potential, then the above criticism of the 'specific reading retardation' theory would still apply. If, on the other hand, IQ may be modified by the environment, then the whole model becomes even less satisfactory. In the opinion of the present writer, until the possible extent of environmental influences on IQ is better established, any method, however statistically sophisticated, which sets expectations of attainment level based on a thinly disguised model of IQ as 'potential,' is to be treated with great caution. The use of such a method to provide evidence for a theoretical model of reading disability seems particularly unjustified, while its use in determining the allocation of remedial teaching resources would seem to be a great mistake, for the reasons given above.

(f) IQ and Bernstein scale scores

As described earlier (Page 240,) the unpublished study

by Bernstein's team into the link between their maternal language behaviour measures and reading attainment also included an investigation of the link between language behaviour and WISC IQ. The following correlation coefficients were reported. (Personal comm. Brandis 1974.)

N.B. This study used the same short form of the WISC as used by Yule et al.

West Ham sample (N = 122)

	'Chat' score	'AwkQs' score
Short IQ	.19	.38

Equivalent coefficients for the present study data were found to be as follows:

Dagenham sample (N = 100)

	'Chat' score	'AwkQs' score
Short IQ	.19	.10
	(p = .040)	(p = .164)

When, however, the 'child reads to mother' factor was adjusted for before calculating the coefficients, the partial correlations obtained on the present study data were found to be:

Partial Correlations (i.e., controlling for 'CtoM.')	'Chat' score	'AwkQs' score
Short IQ	.08	-.02
	(p = 0.223)	(p = 0.403)

The opposite procedure, i.e., partialling out the effects of the Bernstein variables from the correlation of

'CtoM' with Short IQ, produced the following results:

	'CtoM' with Short IQ
zero order partial	0.35
first order partials	
(i) Chat only	0.31
(ii) AwkQs only	0.33
second order partial (i.e., controlling for Chat and AwkQs)	0.31.

It would appear, therefore, that the association found in both West Ham and Dagenham between the Bernstein language scales and Short IQ may be 'borrowed' from other, more influential, home environment variables. This finding is a non-trivial one, because of the widespread acceptance of the over-riding importance of language, and particularly maternal language, as a determinant of educability. Such acceptance may possibly have been premature.

Summary of Findings of the First Junior School Study

The results of this study have already been described and discussed at great length. For convenience, however, the main findings may be summarized in the following nine points:

1. Even in a socially homogenous area, home environment accounts for a very substantial proportion of the variation in children's school achievement - approaching 40% on the present study measures.

2. One feature of the home environment was outstanding as a predictor of reading attainment, and that was whether or not the child was reported as regularly reading to his mother at home. This one variable accounted for well over 30% of the measured variation in reading scores.

3. The apparent predictive power of other indices of home background may be 'borrowed' from the 'child reads to mother' effect. Included here are the reading model provided by the mother, mother reading to child, mother's educational aspirations, and mother's language behaviour. The last mentioned is a particularly important finding, because of the current widespread acceptance of Bernstein's theories concerning the influence of home language environment on educational progress.

4. The inventory of child-rearing practices devised in the pilot study retained a substantial amount of its predictive power when applied to the present study data. Its relationship to reading performance was stronger than that of any other home environment index except 'child

reads to mother,' with a highly significant correlation being maintained even after the overlap between the two predictors had been taken into account.

5. In the present sample, a social class gradient in attainment was maintained even after 'child reads to mother,' as currently coded, was allowed for. On the other hand, the predictive power of mother's educational level was almost entirely explained by its overlap with the 'child reads to mother' variable.

6. IQ was an important simple bivariate predictor of reading attainment in the present sample. Full Scale WISC score accounted for about 30% of reading score variance when it was used as a single predictor.

7. 'Child reads to mother' and IQ overlapped as predictors of reading attainment, i.e., there was a tendency for children who read to their mothers to have both high IQs and high reading scores. When the unique contribution of each variable to the prediction of reading attainment was determined, that of 'child reads to mother' was about 20%, that of IQ_F about 11%, and a further 18% of explained variance remained which was not uniquely attributable to either predictor. Both unique contributions were highly significant statistically.

8. 'Child reads to mother' and IQ had a complex inter-relationship. Children who received this form of help with their reading were particularly strong on General Comprehension, Similarities, and Vocabulary, as measured by the subtests of the WISC; and showed compensatory relative weaknesses on Arithmetic, Picture

Completion, Object Assembly and Coding. The problem of the direction of causality in such inter-relationships has clear educational implications.

9. As was the case in predicting reading attainment, the relationship of the Bernstein Scales to IQ was found to be an apparent artefact of their association with the 'child reads to mother' variable.

Even leaving aside the controversial and difficult issue of IQ, two of these findings in particular go markedly against the current 'flow' of educational thinking.

Firstly, the 'supportive home background' theory has no place in it for the active intervention by parents in the educational process which is represented by the 'child reads to mother' variable. Such intervention, by working class parents in particular, is usually seen as undesirable because of the confusion and difficulties it is assumed to cause for the child.

Secondly, the over-riding importance for education of the language atmosphere of the home, to the exclusion of all other aspects of child-rearing, has been accepted as almost axiomatic by many educationalists. The suggestion, therefore, that there may be alternative explanations for the association between language behaviour and school achievement, is almost heretical.

As a result of these considerations, it was decided to replicate part of the 1974 junior school study on a new sample of children. Answers were to be sought to only two main points:-

(a) Did the 'child reads to mother' effect hold up on a new sample of children? Further was it

possible to refine the coding system for this variable, i.e., could gradations of 'child reads to mother' be established, rather than just the either/or system previously employed? Was the ordered classification obtained reflected in a gradient of achievement?

(b) Was the predictive power of the Bernstein Scales again found to be explicable in terms of their overlap with the 'child reads to mother' variable?

The study which was designed and carried out to provide answers to these questions is described in the chapter which follows.

CHAPTER FOUR

THE SECOND JUNIOR SCHOOL STUDY

Introduction

In terms of overall design, sample selection and so on, this study was an exact replication of the previous one, carried out one year later. The headteachers of the same four junior schools willingly extended their co-operation, and the 1975-76 cohort of first year junior children became the new study population.

Ideally, replication of the IQ dimension of the first study should have been carried out in addition to the home background investigations, but time and resources were limited, and this was judged impracticable. Hence, only two types of data were to be collected on each child - his reading attainment, and selected items of information about his home background.

Finally, information was also to be sought from the four project schools about their methods of teaching reading. At the commencement of the 1974-75 junior school study, discussions with heads had taken place about methods of allocating children to classes, and other aspects of the schools' internal orgnisation. This information had been required for the practical purposes of selecting a sample,

but also as purely descriptive material, to supplement that already obtained on the neighbourhood in which the schools were situated. (All this was considered necessary in order to create a background picture of going to school in Dagenham, against which the facts and figures of the main analyses might be viewed to better effect.)

Preliminary questions about teaching methods had also been asked in these early interviews with heads. This was necessary in order to ensure that no school was using a method such as the initial teaching alphabet, which would affect the children's ability to take reading tests like the Southgate and the NFER 'A', both of which are written in traditional orthography.

In order to formalise this knowledge of methods used, and to get more descriptive information on the schools' practices, it was decided to compose a questionnaire for completion by heads, on the methods of teaching reading employed in their schools. This matter is taken up in more detail in the relevant section below.

Planning the interview schedule to collect the home background information

In order to answer the questions listed at the end of the last chapter, essential components of the new schedule were the two Bernstein scales, and a series of questions which would serve to position a mother at some point on an ordinal scale of 'help with reading.' The first task was to decide the form of that ordinal scale. It was intended that the underlying dimension should be the amount of help (of the 'child reads to mother' variety)

which the child had received since he began learning to read. Since, however, this depended on mothers' recollections, much thought was put into how best to minimise reliance on such a fallible source of information. Direct questions of the form,"In the infants, did you listen to your child read twice or more a week/once a week/less than once a week?" were immediately ruled out for this reason, as was, "Did he read to you for 5 minutes/10 minutes/longer than ten minutes?" Desirable as this sort of information would have been, it was not considered that it could be extracted with sufficient accuracy from mothers' memories of their children's infants' schooldays.

A less ambitious scale of 'amount of help received' was therefore planned, capitalising on information which had been obtained in the first junior school study. In that study, when mothers were asked if they listened to their children read, a common response was "Not any longer," which, on prompting, was expanded into "I used to when he was in the infants, but I haven't since he's been up in this school" (i.e., the juniors.) It was decided that this should be the first distinction to be drawn in the present study - used to help in infants/still helps in juniors. In terms of designing interview questions, this was a helpful distinction to make, but more than that, it was considered to correspond to a very real difference in practice amongst mothers, emerging as it had from their own description of events.

The next step was to add another distinction used in the first study, that of 'help regularly' versus 'the rest.' (The criterion for 'help regularly' is discussed below in

the section on the coding of results.)

There were now two categories of 'help now,' regular help in juniors, and occasional help in juniors; two categories of 'helped once,' regular help in infants and occasional help in infants; plus a final category, never helped at all.

This five-category scale was considered to be both a meaningful dimension in terms of mothers' behaviour, and also a workable research device, in that it was seen to be a relatively easy matter to design a list of questions to ascertain in which category a mother fell.

In constructing these questions, knowledge gained in the previous study was again utilised. Mothers often said they listened to their child read 'whenever he brought his book home.' Since it was desired to minimise reliance on memory by tying down the questions as far as possible to 'concrete' events, this particular event was used as the peg on which to hang a series of questionnaire items. It was decided to begin by asking the mother about her child's time in the infants' school. After only one or two introductory 'padding' questions, a mother was asked if her child had ever brought his book home from school while he was in the infants, and if so, had she ever listened while he read some of it to her. She was then asked if he had brought it home often, and if he had read to her every time, or just sometimes. This was followed by asking if he had ever read aloud to her from anything that was not a school book, and if so, how often. Moving on to the junior school, she was asked if his book ever came home nowadays, if he ever read it to her, and how often; if he read from anything

that was not a school book, and how often.

The questions were closed-ended, in that a number of possible responses were specified in advance. For example, the item on how often he brought his book home in the infants was given the possible codings:

> Almost every night/More than once a week/About once a week on average/Less than that

and each mother's response was coded in these terms. In addition to this coding system, mothers' comments and spontaneous expansions were also always noted. Allocation to a category on the five-point scale of overall help received, referred to above, took place according to a coding system described in the following section.

Since a questionnaire covering only the above points, and the Bernstein scales, would have been short and rather too terse, extra items were added to dilute it a little. It was decided to begin each interview, as previously, with questions about family size and birth order, since it had been found that giving this sort of factual information put a mother at her ease, and got the interview off to a good start. Then, further down the interview protocol, two more items were inserted, on topics which had been found previously to be very good talking points amongst mothers, and also of relevance to the main theme. These were the topics of 'homework' and the initial teaching alphabet. Mothers were asked if they approved of their junior school age children being given reading 'homework,' and if they thought using a method like i.t.a. to teach reading was a good thing. (After, of course, first establishing that they knew what i.t.a. was.) Once again, these questions were closed-ended, in

that possible alternative responses were specified, based on mothers' expressed views in the previous study.

(One further incentive to include a question on mothers' attitude to 'homework' was that a very similar question had been included in the Plowden Report's survey of parental attitudes, (C.A.C.E. 1967), with rather surprising findings. The matter is taken up again in a later section. The relationship of this variable to 'child reads to mother' was also of interest.)

The final order of all these questions, their wording, and the coding categories used, are given in Appendix 8.

Designing the Schools Questionnaire

Information was wanted on the methods of teaching reading employed in the infants and junior departments of the four project schools. In order to discover the essential questions to ask, reference was made to the survey of teaching methods carried out for the Bullock Committee, (D.E.S. 1975), which had been addressed in part to the teaching of reading. Questions asked of teachers had covered basic method used, (phonics, sentence method etc.), reading schemes, supplementary readers, time spent in school on reading, school libraries, books available in classroom, and so on.

Thirteen of the most important of these questions were used as the basis of items in the present study's Schools Questionnaire.

The Bullock survey was concerned with the teaching of reading in schools, and as such, made no mention of parents in its list of questions. Since, however, this topic was of central concern in the present instance, the opportunity was

taken of inserting into the questionnaire one item on the taking home of school reading books, and another on the extent to which parents were encouraged by the school to read to their children or to listen to them read.

The Schools Questionnaires (slightly different versions for infant and junior departments) are shown in their final form in Appendix 9.

Sample and Data Collection

The sample

The sample in the present study was selected exactly as in the previous one. The names of 15 boys and 15 girls were randomly chosen from the first year roll of each of the four schools, after the screening out of 'children of immigrant origin,' and children who had not attended the infants' school of the J.M.I.

The reading testing

The reading test used was the NFER 'A'. The schools were given the choice of testing either all their first year intake, or only those children who were in the N = 120 sample. Two followed the former course and two the latter. Testing was carried out by the schools at their convenience, but with vigorous efforts being made to catch any absentees from the list of selected children. Strict instructions were given that the test papers of children on the list were to be forwarded to the researcher for marking, but arrangements for the other children were left to the schools' discretion.

The home interviews

Once again, the practical arrangements involved in carrying out the interviews in the present study followed the methods of the previous one exactly. In particular, appointments were avoided whenever possible, and almost all interviews were carried out on the researcher's first

visit. Introductory letters were taken home by the 30 sample children in each school. Following previous practice, interviewing proceeded in each school's catchment area for two weeks. Women not contacted during this period were not followed up. (See Page 247 for a discussion of the effects of this procedure on sample composition.) In all, contact was made with 106 women. Owing to pressures of family illness, one woman declined to participate in the study, (the word 'declined' is deliberately chosen here, as a more apt description of her behaviour than 'refused'.) 105 women were eventually interviewed, once again a high success rate for a study of this type.

Although great efforts were made by the schools to test the reading of all these 105 children, one child was persistently absent, and was eventually admitted to hospital before he could be tested.

The final sample size in this study, i.e., the number of children with both interview and reading data available, was therefore 104.

The Schools Questionnaire

The headteachers of the infants and junior departments of the four schools completed the questionnaire on the methods used in their school to teach reading.

Coding of the Data

The completed sample

At the completion of data collection, information was available for 104 children on the topics listed in Table 83.

Table 83

The second junior school study:
information available on the final sample

Factors in the home

Demographic	Child rearing
Social class	Child reads to mother: 5-point scale
Total family size	Bernstein 'Chat' scale
No. older sibs	Bernstein 'Awkward Questions' scale
No. younger sibs	Mother's attitude to homework
Family circumstances	Mother's attitude to i.t.a.

Data on the child

Demographic	Test scores
Sex	NFER 'A' reading
Age	
School	

In addition, information was available from the four project schools on the methods used to teach reading in their infant and junior departments.

Coding of the interview data

All the home background information was coded before the reading tests were marked.

Demographic information

Information had been collected on social class, indices

of family size, and family circumstances. These variables were coded exactly as in the previous study.

Bernstein scales

The Bernstein scales were coded and scored exactly as previously, i.e., following the original instructions very carefully.

The 'Child reads to mother' variable

As described earlier, it was desired to categorize mothers as :

1. Regular help in juniors
2. Occasional help in juniors
3. Regular help in infants only
4. Occasional help in infants only
5. Never helped

The questions actually asked of mothers had been more concrete - how often did he bring his book home? Did he always read it to you? Did he read anything else to you?

Starting at the bottom, as it were, women who had never given any help were easily classified. Even if their children brought books home, they were not given help with them, nor ever had been. Nor did these children ever read to their mothers from any other source.

Considering next the two 'help in infants' categories. Mothers fell into this group if, at some time they had listened to their children read, but no longer did so. Again, books might or might not come home, but in neither case was any help given at the present time. With reference to mothers' infants school practices, the data from 'how often did the book come home?', 'did he always read it to

you?' and 'did he ever read anything else to you?' were combined. If the end product of all this was that the infants' school child was reported as having read to his mother, from any source, twice a week or more on a routine basis, then that child was classified as having received regular help in the infants. Reading to mother only once a week or less was classified as occasional help. This distinction, while sounding somewhat arbitrary, in fact corresponded to a very clear difference in the response of mothers to 'how often...' questions, which had been observed and noted during the interviews. The response of some mothers to this sort of question was an immediate statement, such as "About every other night" or "Twice a week at least." Others would say, "Now and again" - a self-confession of occasional help - or hesitate, and on prompting, opt for either, "Once a week on average" or "Less than that." It must be stressed that this subjective assessment was not the basis of category assignment, but that it was found to respond to it very closely: mothers who listened twice a week or more were sure of the fact and ready to say so, whereas mothers whose help was more spasmodic revealed it by their uncertainty as to the frequency of its occurrence.

Considering next the mothers' junior school practices, a similar procedure was applied. School books now seemed to come home less frequently, so mothers who only helped as a response to this stimulus were usually classified as 'occasional helpers,' (whereas in the infants, many had been prompted to give regular help by the regular appearance of the school book.) The children who received 'regular

help' (on the same 'twice a week at least' criterion) almost always read from other sources besides books from school. For this reason, the distinction between 'occasional' and 'regular' help, in terms of type and quality of material involved, probably meant different things in the infants and junior categories.

It was recognised that treating the categories of 'help given' as points on an ordinal scale would only be justifiable if the relationship between mothers' infant and junior school practices took a certain form. To be specific, in scale terms, mothers were problematic if they helped in the juniors after not having done so in the infants.

When the data were examined, six mothers were found to comply with this description, four of these being classified as 'occasional' help givers in the juniors, and two as 'regular' help givers. As far as could be established, none of these mothers resembled the late help givers found in the previous study, (see Page 263), who had only begun to help as a result of poor reports from school. The change of practice of all four occasional helpers, and one of the regular helpers, seemed to have been prompted by the appearance of books from school for the first time. The remaining regular help giver had apparently responded simply to her child's increased age: "She's old enough now."

The numbers were too small to place these mothers in separate categories of their own: a decision, therefore, had to be made about which of the existing categories they

should be put into, bearing in mind any effect this would have on the interpretation of the findings. In the 1974-75 study, coding of the help variable had been based entirely on what was being done at the time, i.e., in the junior school. It was decided to apply this model to the present study also, i.e., the six late helpers were classified according to their junior school practice as 'regular...' or 'occasional help now.'

One further mother was found who had increased the frequency of her help from 'occasional' in the infants to 'regular' in the juniors. This mother was classified as 'regular help now,' following the same model as above.

All these category assignments took place before the children's reading attainments were known.

The other type of assignment problem which occurred in this study had occurred previously - how to classify children who used to read regularly to their mothers, but now did so less than before because they were good readers and generally preferred to get on on their own. (Nine children fell into this category.) The problem was discussed on Page 123, and reference made to the work of Morris (1966) who had encountered the same difficulty. The decision reached by Morris, and independently here, was that these children should be placed in the top category. After all, the problem is one of where to draw the line - twelve year olds probably read to their parents very rarely, if at all, and the most able readers probably stopped doing so earlier than the others. When this situation arose during interviewing, extra questions were asked as a precaution against incorrect assessment, i.e., checks were made that the child

had received regular help in the infants, and that the mother was still willing to help now, but the child was refusing her offers. No child 'failed' any of these extra conditions for classification in Group 1. Once again, these category assignments were made before the reading data was made available.

Mothers' attitude to homework and to i.t.a.

On the subject of mothers' attitudes to reading homework, three possible alternative responses had been suggested in advance:

Approval / No objection / Disapproval.

During interviewing, it was found that a fourth category was required for mothers who made a clear distinction between ordinary 'homework,' and homework for a child who was behind in his work, only the latter receiving approval. This variable was, therefore, eventually coded on a four-way classification.

Similarly, when mothers' opinions of i.t.a. were sought, four possible responses had been originally specified:

Against it / Neutral / In favour / Never heard of it

During interviewing, it was found that mothers spontaneously gave reasons for their opinions, and it was possible to subdivide the 'Against i.t.a.' group into three subgroups:

Against it, specifically because parents cannot help /
Against it, - "learning twice" / Just against new methods.

Further, nobody was actually neutral on the subject, although some mothers conceded they 'wouldn't mind' if it worked. Even those mothers who approved put this same condition - 'if it works' - on their approval, so these two groups, 'neutral' and 'in favour,' were combined.

The Schools' Questionnaire

This questionnaire had been completely close-ended, and so required no further coding as such. The information it provided is considered in a later section.

Descriptive Statistics

Interview data

The distributions of the categoric variables were as shown in Table 84.

Table 84

The second junior school study: distributions of the categoric variables

Demographic information — Total N = 104

Social class	
III NM	16
III M	55
IV & V	22
Unemployed	5
No male head of household	6

Total family size	
1 or 2	34
3	39
4 plus	31

No. older sibs	
0	29
1	39
2 plus	36

No. younger sibs	
0	52
1	36
2 plus	16

Family circumstances	
'Normal'	98
'Atypical'	6

Sex	
Boys	53
Girls	51

School	
V	26
T	26
S	25
P	27

Cont...

TABLE 84 Cont...

Child-rearing information

(N.B. The questions on mothers' attitudes to 'homework' and to i.t.a. are considered in a later section.)

Child reads to mother

Regularly in juniors	39
Occasionally in juniors	23
Regularly in infants	19
Occasionally in infants	11
Never	12

The distributions of the demographic variables were all unremarkable, and resembled closely those obtained in the previous study.

In the case of the 'child reads to mother' variable, in order to compare the present findings with those of the last study, it is necessary to combine the bottom four categories of the above table into one.

(The last study looked at 'regularly read now' versus 'the rest.' Only category one in the present study contains children who 'regularly read now.') Table 85 was produced when the findings of the two studies were compared.

Table 85

Numbers of children who 'regularly read now' in the first and second junior school studies

	1974-75	1975-76
Regularly read now	47	39
Other	53	65
	100	104

As may be seen, the proportion of children who fall into the 'regularly read now' category appears to have dropped very slightly. The difference, however, falls short of statistical significance. (Corrected χ^2 = 1.52 with 1 df. Not significant.)

The Bernstein scales

Inspection of the histograms of these two variables showed that both distributions were sufficiently normal to fulfil the requirements of parametric statistics tests. Summary data for the distributions are given in Table 86.

Table 86

The Bernstein scales: summary statistics

(First junior school study figures given in brackets)

	Mean	S.D.	Possible range
'Chat' scale	13.1 (12.2)	3.35 (3.31)	0 - 21
'AwkQs' scale	19.8 (18.5)	4.01 (4.31)	2 - 26

On both the 'Chat' and 'AwkQs' scales, the distribution means obtained in the second study were slightly higher than the figures of the previous year (With 1,202 df: $F = 3.76$, $p = .054$ and $F = 5.03$, $p = .026$ respectively.)

The reading data

The distribution of reading scores was approximately normal, with a mean of 96.3 and an S.D. of 12.8. Three children hit the floor of the test, and no child reached the ceiling. These results are very similar to those obtained in the previous study, when the figures were 94.2 and 11.5 respectively. (With 1,202 df: $F = 1.44$, $p = .23$)

The Schools Questionnaire

The results of this aspect of the study are reported in a later section.

Analysis of the Reading Data

The first stage in the analysis was to calculate the correlation coefficients between reading score and the main study variables.

The 'child reads to mother' variable

A non-parametric measure of correlation was used for this variable, since its measurement status and its distribution did not justify the use of parametric methods of analysis.

The obtained Spearman coefficient, for the relationship between reading score and 'child reads to mother' was 0.65. ($p < .001$)

The Bernstein scales

The Pearson coefficients for the relationship between Bernstein scales and reading score were as follows :

	'Chat'	'AwkQs'
NFER	+ 0.01	- 0.01

(neither coefficient statistically significant)

As may be seen, all trace of a relationship had disappeared in both cases. This was a somewhat surprising finding since, as far as could be judged, the present study had replicated the previous one exactly on the subject of the Bernstein scales. As then, data collection had been carried out with a great deal of care, and the original wording of the questions had been followed exactly .

On looking back at both the original research using the scales, and the prevous Dagenham study, it was observed that, while significant statistically, the correla-

tions obtained did not suggest particularly strong relationships between scale scores and reading attainment. (As a reminder, reported correlation coefficients with reading score were:

Brandis et al:	AwkQs	0.32 with Neale Accuracy
	"	0.32 with Neale Comprehension
	Chat	0.28 with Neale Accuracy
	"	0.26 with Neale Comprehension
Present study:	AwkQs	0.33 with NFER 'A'
(1974-75)	Chat	0.23 with NFER 'A')

It is possible that, in a relatively small sample such as this, a few unusual responses could distort the overall pattern of results quite markedly; and if the relationship in question were not very strong, such chance fluctuations might be sufficient to obscure it. However, it must be admitted that a satisfactory explanation was not, nor has been, found for the complete failure to replicate previous results, which is indicated by the figures given above.

An important consequence of this failure was that it vitiated one of the main aims of the present study, namely, to check on the finding that much of the predictive power of the Bernstein scales was 'borrowed' from other variables. It would have been pointless to place the 'child reads to mother' variable in a regression analysis with the Bernstein data described above, although that had been the original intention. The analysis was, therefore, terminated at the level of simple bivariate correlations, on the grounds that further numerical manipulations would be an empty exercise.

The data obtained here confirm that the association between reading attainment and 'child reads to mother' is much stronger than the former's association with maternal

language behaviour, as measured by the Bernstein scales. Since, however, a measurable 'Bernstein scale/reading attainment' association was not found, it was impossible to determine the extent of its dependence on the 'child reads to mother' factor. Having decided that this, the second aim of the present study, could not be achieved, attention was turned again to the first aim, that of testing the power of the 'child reads to mother' variable as a predictor of reading achievement.

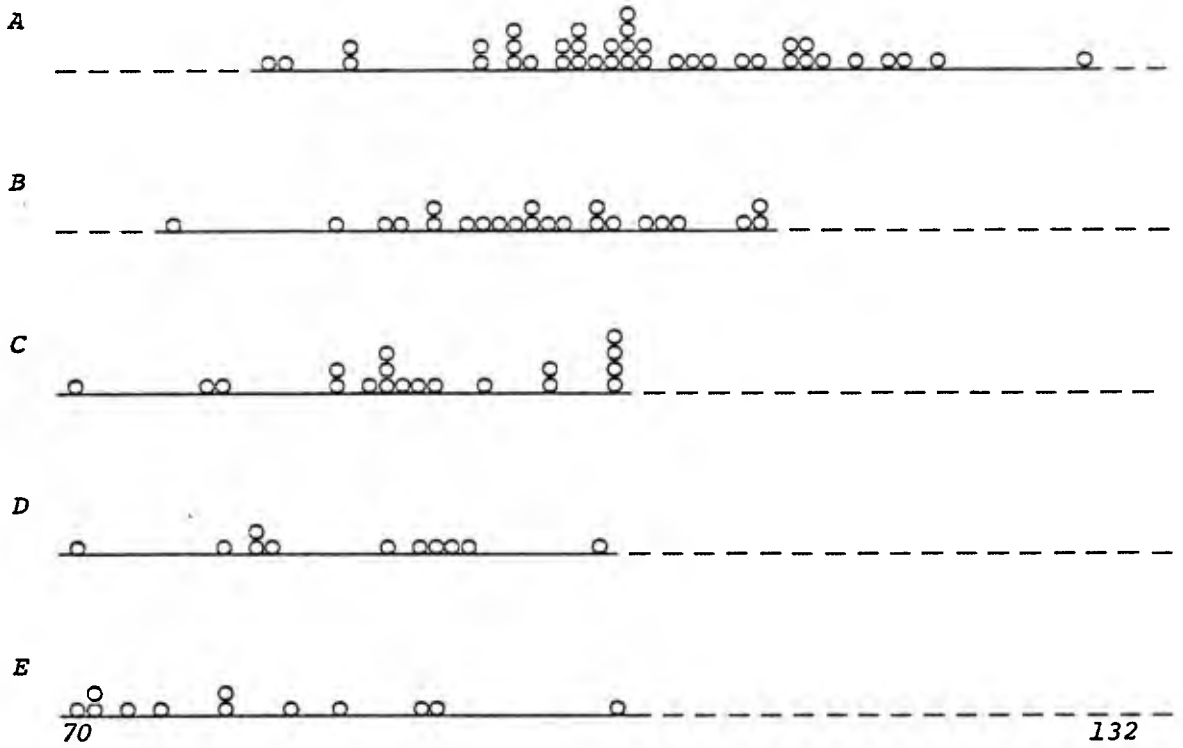
The 'child reads to mother' variable

The association between reading score and 'child reads to mother' has so far only been described in correlation coefficient terms. In order to understand the relationship better, a stratified histogram of reading scores was plotted, and is shown in Figure 72, together with certain descriptive statistics.

A one-way Analysis of Variance was carried out and revealed that the relationship between amount of help given and reading attainment was statistically highly significant. ($F = 18.5$ with 4,99 d.f. $p < .0001$)

About 42% of the variance in reading attainment in the present sample was explained by just this one factor, 'child reads to mother.' The reason why this percentage is higher than previously - unusual in a replication study - is, of course, that the sensitivity of the measure had been increased. It is regrettable that practicalities prevented both IQ and this refined measure of 'child reads to mother' being obtained on the same sample. Had they been, better understanding of the inter-relationships between the two

Figure 72. Reading score by Child reads to mother



Group	Help received	Mean	SD	(N)
A	Regular help in juniors	104.9	10.9	(39)
B	Occasional help in juniors	98.3	8.8	(23)
C	Regular help in infants only	91.2	9.3	(19)
D	Occasional help in infants only	86.7	9.0	(11)
E	Never helped	81.1	10.3	(12)
	Total sample	96.3	12.8	(104)

variables might have been achieved than was possible with the original crude coding system.

It is of interest to note at this point the numbers of children in each of the five 'help with reading' categories. Over a third of the sample were reported as still regularly being heard read by their parents; and this in a working class area where, according to educational tradition, parents are uninterested in the school progress of their children. Less than one eighth of the children were said to have never received help of this kind at any stage. The remaining half of the sample had received, or were still receiving, some measure of this particular sort of help from their parents.

Of those parents who helped their children with reading in the infants school, about two-thirds were still giving at least occasional assistance in the juniors. Why the other third ceased helping is a matter for conjecture. The subject is brought up again in the section below, which considers the influence of the school on parental practices.

Inspection of the histogram in Figure 72 suggests one further important point, which is that no help is wasted. Even occasional help in the infants gives children an advantage over those who never had any; regular help in the infants is more valuable still, and continued assistance into the junior school produces a substantial further improvement. The difference in mean reading score between the two extreme groups - 'never helped' and 'regular help in juniors' - is about 24 points, equivalent, as a very rough guide, to about two years of reading age.

The importance of the 'child reads to mother' variable was certainly amply confirmed by the findings of the present study.

Demographic variables

Since quantification of relationships in correlation coefficient terms was not required for the purposes of lengthy regression analyses, more familiar analysis of variance techniques were employed to complete the examination of the present study data. The variables examined as predictors of reading attainment were social class, indices of family size, family circumstances, sex, and school attended. The results of the analyses are presented in Table 87.

Table 87

Demographic variables and reading attainment

Predictor	Subgroup mean scores		N
1. Social class	III NM	102.0	16
F = 3.50 with 2,95 df.	III M	96.7	55
p < .05	IV & V) Unemployed)	91.7	27
(N.B. Families with no male head of household were excluded from this analysis. Their mean reading score, N = 6, was 97.7)			
2. Total family size	1	97.3	9
F = 0.47 with 4,99 df.	2	98.4	25
Not significant	3	96.4	39
	4	92.9	15
	5 +	95.2	16
3. Number older sibs	0	98.0	29
F = 0.71 with 3,100 df.	1	95.1	39
Not significant	2	98.8	16
	3 +	93.9	20

/4... Cont...

Table 87..... Cont...

Predictor	Subgroup mean scores		N
4. Number younger sibs	0	97.9	52
F = 0.87 with 2,101 df.	1	94.5	36
Not significant	2 +	94.8	16
5. Family circumstances	'Normal'	96.3	98
F = 0.01 with 1,102 df.	'Atypical'	95.8	6
Not significant			
6. Sex	Girls	98.5	51
F = 3.03 with 1,102 df	Boys	94.1	53
Not significant			
7. School attended	V	99.5	26
F = 5.33 with 3,100 df.	T	97.9	26
p < .01	S	99.8	25
	P	88.3	27

As may be seen, only statistically significant effects were found - social class and school attended - plus the suggestion of a sex effect, which was bordering on statistical significance.

Contingency tables were constructed to see how these three variables were related to 'child reads to mother,' with the results shown in Tables 88 to 90.
(N.B. For the purpose of these analyses, 'child reads to mother' was recoded with the bottom four categories combined. See Page 411 for explanation of this procedure.)

Two-way Analyses of Variance were then carried out to determine the extent of the overlap between the demographic variables and 'child reads to mother' in the prediction of reading attainment. (Tables 91 to 93)

Looking first at the analysis of variance results at the top of each Table, it may be seen that the independent main effects of social class and sex are not statistically

Table 88. Child reads to mother x Class

CTOM	CLASS: NON-MANUAL (1.)	SKILLED MANUAL (2.)	SEMI & UNSKILLED (3.)	ROW TOTAL
1. REGULAR HELP JUNIORS	8	22	4	34
	23.5	64.7	11.8	34.7
	50.0	40.0	14.8	
	8.2	22.4	4.1	
2. OCCAS. HELP JUNIORS (OR LESS)	8	33	23	64
	12.5	51.6	35.9	65.3
	50.0	60.0	85.2	
	8.2	33.7	23.5	
COLUMN TOTAL	16	55	27	98
	16.3	56.1	27.6	100.0

RAW CHI SQUARE = 7.04709 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .0295
CRAMER'S V = .26816

Table 89. Child reads to mother x School

CTOM	SCHOOL: V (1.)	T (2.)	S (3.)	P (4.)	ROW TOTAL
1. REGULAR HELP JUNIORS	8	9	17	5	39
	20.5	23.1	43.6	12.8	37.5
	30.8	34.6	68.0	18.5	
	7.7	8.7	16.3	4.8	
2. OCCAS. HELP JUNIORS (OR LESS)	18	17	8	22	65
	27.7	26.2	12.3	33.8	62.5
	69.2	65.4	32.0	81.5	
	17.3	16.3	7.7	21.2	
COLUMN TOTAL	26	26	25	27	104
	25.0	25.0	24.0	26.0	100.0

RAW CHI SQUARE = 14.66816 WITH 3 DEGREES OF FREEDOM. SIGNIFICANCE = .0021
CRAMER'S V = .37555

Table 90. Child reads to mother x Sex

CTOM	SEX: GIRLS (1.)	BOYS (2.)	ROW TOTAL
1. REGULAR HELP JUNIORS	24	15	39
	61.5	38.5	37.5
	47.1	28.3	
	23.1	14.4	
2. OCCAS. HELP JUNIORS (OR LESS)	27	38	65
	41.5	58.5	62.5
	52.9	71.7	
	26.0	36.5	
COLUMN TOTAL	51	53	104
	49.0	51.0	100.0

CORRECTED CHI SQUARE = 3.14219 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = .0763
PHI = .19368

Table 91. Analysis of Variance: Reading score by CtoM x Class

* * * * * * * * * * A N A L Y S I S O F V A R I A N C E * * * * * * * * * *

NFERA NFER A READING TEST SCORE
BY CTOM CHILD READS TO MOTHER
CLASS SOCIAL CLASS

* *

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS	4640.705	3	1546.902	13.306	.001
CTOM	3554.276	1	3554.276	30.574	.001
CLASS	309.822	2	154.911	1.333	.269
2-WAY INTERACTIONS	506.110	2	253.055	2.177	.119
CTOM CLASS	506.110	2	253.055	2.177	.119
EXPLAINED	5146.816	5	1029.363	8.855	.001
RESIDUAL	10695.236	92	116.253		
TOTAL	15842.051	97	163.320		

98 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

* * * M U L T I P L E C L A S S I F I C A T I O N A N A L Y S I S * * *

NFERA NFER A READING TEST SCORE
BY CTOM CHILD READS TO MOTHER
CLASS SOCIAL CLASS

* *

GRAND MEAN = 96.17

VARIABLE + CATEGORY	N	UNADJUSTED DEV'N	UNADJUSTED ETA	ADJUSTED FOR INDEPENDENTS DEV'N	ADJUSTED FOR INDEPENDENTS BETA	ADJUSTED FOR INDEPENDENTS + COVARIATES DEV'N	ADJUSTED FOR INDEPENDENTS + COVARIATES BETA
CTOM							
1 REGULAR HELP JUNIORS	34	9.12		8.58			
2 OCCAS HELP JUNIORS (OR LESS)	64	-4.85	.52	-4.56	.49		
CLASS							
1 NON MANUAL	16	5.83		3.92			
2 SKILLED MANUAL	55	.48		-.22			
3 SEMI AND UNSKILLED	27	-4.43	.26	-1.82	.14		

MULTIPLE R SQUARED .293
MULTIPLE R .541

Table 92. Analysis of Variance: Reading score by CtoM x School

* * * * * * * * * A N A L Y S I S O F V A R I A N C E * * * * * * * * *

NFERA NFER A READING TEST SCORE
BY CTOM CHILD READS TO MOTHER
SCHOOL

* *

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS	5963.989	4	1490.997	13.778	.001
CTOM	3622.867	1	3622.867	33.479	.001
SCHOOL	1335.804	3	445.268	4.115	.009
2-WAY INTERACTIONS	621.586	3	207.195	1.915	.132
CTOM SCHOOL	621.586	3	207.195	1.915	.132
EXPLAINED	6585.575	7	940.796	8.694	.001
RESIDUAL	10388.415	96	108.213		
TOTAL	16973.990	103	164.796		

104 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

* * * M U L T I P L E C L A S S I F I C A T I O N A N A L Y S I S * * *

NFERA NFER A READING TEST SCORE
BY CTOM CHILD READS TO MOTHER
SCHOOL

* *

GRAND MEAN = 96.26

VARIABLE + CATEGORY	N	UNADJUSTED DEV'N	UNADJUSTED ETA	ADJUSTED FOR INDEPENDENTS DEV'N	ADJUSTED FOR INDEPENDENTS BETA	ADJUSTED FOR INDEPENDENTS + COVARIATES DEV'N	ADJUSTED FOR INDEPENDENTS + COVARIATES BETA
CTOM							
1 REGULAR HELP JUNIORS	39	8.61		8.22			
2 OCCAS HELP JUNIORS	65	-5.17		-4.93			
(OR LESS)			.52		.50		
SCHOOL							
1 V	26	3.20		4.09			
2 T	26	1.66		2.04			
3 S	25	3.50		-.51			
4 P	27	-7.93		-5.43			
			.37		.28		

MULTIPLE R SQUARED .351
MULTIPLE R .593

Table 93. Analysis of Variance: Reading score by CtoM x Sex

* * * * * * * * * * A N A L Y S I S O F V A R I A N C E * * * * * * * * * *

NFERA NFER A READING TEST SCORE
BY CTOM CHILD READS TO MOTHER
SEX

* *

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS	4711.252	2	2355.626	19.210	.001
CTOM	4222.043	1	4222.043	34.430	.001
SEX	83.067	1	83.067	.677	.412
2-WAY INTERACTIONS	.011	1	.011	.000	.992
CTOM SEX	.011	1	.011	.000	.992
EXPLAINED	4711.264	3	1570.421	12.806	.001
RESIDUAL	12262.727	100	122.627		
TOTAL	16973.990	103	164.796		

104 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

* * * M U L T I P L E C L A S S I F I C A T I O N A N A L Y S I S * * *

NFERA NFER A READING TEST SCORE
BY CTOM CHILD READS TO MOTHER
SEX

* *

GRAND MEAN = 96.26

VARIABLE + CATEGORY	N	UNADJUSTED DEV'N	UNADJUSTED ETA	ADJUSTED FOR INDEPENDENTS DEV'N	ADJUSTED FOR INDEPENDENTS BETA	ADJUSTED FOR INDEPENDENTS + COVARIATES DEV'N	ADJUSTED FOR INDEPENDENTS + COVARIATES BETA
CTOM							
1 REGULAR HELP JUNIORS	39	8.61		8.38			
2 OCCAS HELP JUNIORS (OR LESS)	65	-5.17	.52	-5.03	.51		
SEX							
1 GIRLS	51	2.21		.93			
2 BOYS	53	-2.13	.17	-.89	.07		
MULTIPLE R SQUARED					.278		
MULTIPLE R					.527		

significant, while the main effect of school attended remains significant at the .01 level. In the first two cases, the Multiple Classification Analysis Tables are particularly revealing. Adjusting for the 'child reads to mother' factor reduces the gap between the mean reading scores of the highest and lowest social class groups from more than 10 points to less than six. Similarly, the sex difference falls from 4½ points to less than 2. In other words, the simple bivariate association of both class and sex with reading attainment was at least in some measure due to their association with the 'child reads to mother' variable. Higher social class mothers are more likely to listen to their children read, as are the mothers of girls. If these factors are taken into consideration, then the unique effects of class and sex are both much diminished.

The Multiple Classification Analysis Table for the 'CtoM' by School analysis suggests that, while the two variables are confounded to a certain extent - the gap between the worst and best schools does narrow after adjusting for 'CtoM' - a significant school effect remains unexplained.

The school effect

Although somewhat tangential to the main analysis, this issue was pursued further, because data was available, from the Schools' Questionnaire, which had bearing upon it.

The information supplied by the schools about their methods of teaching reading had originally been intended for descriptive purposes only, i.e., to complement information about such factors as school size and streaming arrangements. The Questionnaire information was also needed to

demonstrate formally what had been known informally from the very beginning of the study, namely that none of the four schools used teaching methods such as i.t.a. which might materially affect their children's ability to score on a conventional reading test such as the NFER 'A'.

As was described earlier, in the section on the design of the Schools Questionnaire, the opportunity was taken of including items on whether the children were allowed to take books home, and on parental participation in the children's reading. These items are shown in Table 94 below, together with an introductory item (Item 9) taken from the Bullock survey; the schools' coded responses are given in Table 95. As may be seen, in the junior departments, three out of the four schools claimed that they 'encouraged' parents to listen to their children read; how active this encouragement was remains an open question. Certainly, these schools claimed to back this policy to the extent of allowing the children a free hand in taking school books home. The fourth school had very different policies in this direction, as the table makes plain.

When the full crosstabulation table of 'CtoM' by school was examined, the results suggested that the schools' strategies had had an effect on the practices of the parents. (Table 96)

The numbers are small, and firm conclusions may not be drawn, but School P, which welcomed parental participation in the infants, but not in its junior department, does appear to have a shortage of parents in columns 1 and 2, which represent 'help now,' and a surplus in columns 3 and 4, which represent 'helped in past.'

Table 94

Extract from Schools' Questionnaire

9. Are children allowed to take any books for use at home?

   (a) Reading scheme book
   (b) Supplementary reader
   (c) School library books

10. If other than school library book to (9) above, how often are books allowed to be taken home?

   (a) As often as child wishes
   (b) More than once a week
   (c) About once a week
   (d) Occasionally only, e.g., when moving up a book in a graded scheme

11. Are parents encouraged:

   (a) To read to their children
   (b) To listen to their children read
   (c) Not to try to help their children at home, in case it confuses them?

Table 95

Coded responses to items 9-11 of the Schools' Questionnaire

Item No.	Infants Schools			
	V	T	S	P
9.	c	a, b & c	a & b	a, b & c
10.	-	c	a	a
11.	a	a & b	a & b	a & b
	Junior Schools			
	V	T	S	P
9.	a, b & c	a, b & c	a, b & c	c
10.	a	a	a	-
11.	a & b	a & b	b	c

Table 96

Full cross-tabulation of 'CtoM' by School

	'CtoM' 1	2	3	4	5	
V	8	8	3	4	3	26
T	9	8	6	1	2	26
S	17	3	1	1	3	25
P	5	4	9	5	4	27
	39	23	19	11	12	

'CtoM' categories:

1. Regular help in juniors
2. Occasional help in juniors
3. Regular help in infants only
4. Occasional help in infants only
5. Never helped.

χ^2 = 24.75 with 12 df. p = .016

(On a somewhat anecdotal level, the expressed opinions of the junior school head in School P are worth reporting here. The topic of parents having arisen in informal conversation, this head commented that he "never used to mind" the children taking books home, and showing them to their parents, but the recent discovery that some parents were listening to their children read and "overdoing it - up to an hour at a time" had prompted him to change his mind. Since this was recounted as a very recent phenomenon, it is possible that it explains why a relative shortage of 'Group 1' parents was found at his school in 1975 but not in 1974.)

The analysis of variance of 'CtoM' by school (which compared 'CtoM' group 1 with groups 2-5) showed that the shortage of group 1 parents was not entirely responsible for School P's poor performance (Table 92.) The breakdown of mean reading scores shown in Table 97 illustrates this point very clearly.

Table 97

Mean NFER 'A' reading score by 'CtoM' (1:2-5) within school

		Mean	N
School V	Regular help in juniors	107.1	8
	Other	96.1	18
School T	Regular help in juniors	105.0	9
	Other	94.2	17
School S	Regular help in juniors	106.8	17
	Other	84.7	8
School P	Regular help in juniors	94.4	5
	Other	87.0	22
		96.3	104

It may be, of course, that the five children from School P who fell into the highest 'CtoM' Category had comparatively low scores for purely chance reasons. On the other hand, without a suitable supply of books from the school, it might be that parental help was less effective for these children. Finally, the answer might lie in some process quite internal to the school. The remaining questionnaire data from the schools was scanned with this in mind, but revealed no noteworthy inter-school differences in methods or materials. The issue was not pursued any further.

The results from the Schools Questionnaire are presented in full in Appendix 9. This exercise had served its purpose, in that the four schools had all been shown to use very similar methods and materials for the classroom teaching of reading. Since, however, the questionnaire had not been designed to reveal inter-school differences in the quality

of reading teaching, the data from it had no more than descriptive value, and it is not considered in further detail here.

The analysis of the reading data was completed at this point. All that remains to be reported are the answers obtained to the extra questions inserted into the home interview schedule, on mothers' attitudes to reading 'homework' and the initial teaching alphabet.

Mothers' Attitudes to Reading 'Homework' and to the Initial Teaching Alphabet

As was described in the section on planning the interview schedule for the present study, questions were asked on the above topics for two reasons: to 'pad out' the interview schedule, and to collect systematic information on subjects which had emerged during the 1974 interviewing as being of concern to mothers.

On the first topic, mothers were asked if they approved of their child being given reading to do at home. On the second topic, they were first asked if they had 'come across' any 'new ways' of teaching reading, and if so, what they thought about them. As had been found in the previous study, mothers were usually well aware of school practices regarding reading teaching, particularly in the sense that they noticed departures from traditional methods and materials. (It was not unusual for feelings to run very high about them too.) Mothers who had 'come across' such departures themselves, or had heard about them from friends, were questioned further to establish the nature of the 'new method' under discussion. If it was revealed to be i.t.a. - easily recognisable by mothers' references to 'funny letters' or similar - then opinions were elicited as to its use in schools.

The answers obtained to these two questions are summarized in Tables 98 and 99.

Table 98

Mother's attitude to child being given reading to do at home

Definitely approve	75
No objection ("don't mind")	12
Against it unless child is behind	7
Just against it	10
	104

Table 99

Mother's attitude to i.t.a.

Against it, specifically because parents cannot help	26
Against it - "learning twice"	8
Just against new methods	35
Not mind if it worked, or in favour	19
No knowledge of i.t.a.	16
	104

i.t.a. Considering first mothers' attitudes to i.t.a., it is of interest that only 16 people had never heard of it or 'come across' it at all. Admittedly, quite a number of the 35 mothers who were 'just against new methods' probably had a very scant idea of what was involved, but just the suggestion of an unconventional system of writing seemed to have been sufficient to arouse hostilities in quite a number of cases.

Of more interest still are the mothers in the top two categories in Table 99. All of these women - about a third of the sample - had a fairly clear idea of what i.t.a. was about. Most of them spontaneously mentioned it by name - "Oh, you mean that i.t.a. business, don't you? I don't like it!" As the table suggests, these 34 women went on to give reasons for their dislike of i.t.a.; either that it meant 'learning twice' or, of particular interest here, because they thought it would be difficult to help their children with reading, if the school used a method such as i.t.a., which parents did not understand. Twenty-six women, exactly a quarter of the sample, made comments in this vein quite spontaneously. (i.e., it was never suggested to them by

the interviewer that this might be a problem.)

Pursuing this subject further would be a study in its own right, but before moving on to the next topic, it is worth mentioning one further point: mothers who disliked i.t.a. because they would be unable to help with it often added remarks such as, "They never tell you anything round there. They'd never tell you anything about it." The impression gained from this is of a serious failure by some schools at least to establish even basic channels of communication between home and school. Disregard - and underestimation - of the contribution of parents to children's learning could not be more clearly demonstrated.

Reading 'homework'

As was earlier explained, one of the reasons for asking mothers' opinions on this matter was that the Plowden Survey (C.A.C.E. 1967) had obtained rather surprising findings to a similar question. The Plowden parents were asked if they approved of their child being given school work to do at home. No specific reference was made to reading. Overall, a full three-fifths of parents expressed their approval of this practice, and, what was still more unexpected, social class differences were found to be marginal (63% approving in social class I as against 54% in social class V.)

In the present study, mothers were asked specifically about reading. Three-quarters of the sample approved of children being given reading to do at home, and only one-sixth objected. (The high percentage of 'approvers' might be the result of asking specifically about reading, rather than school work in general, but there is no way of establish-

ing this for certain using the data available.)

The question immediately arises of how prepared parents who approved of reading 'homework' would be to participate in it themselves. Since it was known that schools' practices varied, i.e., not all parents had equal opportunities to help, the present study data could not answer this question directly. It was possible, however, to look at the association between attitudes to homework and the 'child reads to mother' variable. The crosstabulation shown in Table 100 was obtained.

Table 100

'CtoM' by attitude to 'homework'

	Attitude to 'homework'			
Child reads to mother	Approve (A)	No objection (B)	Disapprove unless child behind (C)	Disapprove (D)
Regular help in juniors (1)	36	2	0	1
Occas. help in juniors (2)	13	5	4	1
Regular help in infants only (3)	12	2	3	2
Occas. help in infants only (4)	8	1	0	2
Never helped (5)	6	2	0	4
	75	12	7	10

In some cases, it was known why apparent contradictions between attitudes and practice arose. The two mothers in cells D1 and D2 no longer saw the need for 'homework,' since their children (reading scores 123 and 112 respectively) were more interested in books from the public library than set

reading from school. As for the six people in cell A5, one mother was herself illiterate, so could not help her child, although she wanted to do so very much. Presumably some of the other mothers in this column believed in the value of 'homework,' but not that they should participate in it: the two attitudes are compatible, but apparently an unusual combination. Nearly all the mothers who approved of 'homework' had given their child help with his reading at some stage in his school career. Of those who no longer listened to reading as a regular practice, some presumably felt that they had done enough, but others would perhaps have been prepared to continue giving help, if the schools had created the right circumstances.

The results reported in the above sections relate to issues tangential to the main themes of the present study. In some respects, they raise more questions than they answer, but what they certainly do not do is provide any evidence to support the traditional image of working class parents lacking interest in their children's education. On this point, they fully corroborate the results of the main part of this study, and by so doing, provide useful supportive evidence for the arguments developed in the discussion which takes place in Chapter 6.

Summary of Findings of the Second Junior School Study

Main findings

1. The importance of the 'child reads to mother' variable as a predictor of reading attainment was amply confirmed. Further, the more help of this nature that a child had received since beginning to learn to read, the higher his reading attainment was likely to be.

2. The predictive power of the 'child reads to mother' variable was much greater than that of the Bernstein scales' assessment of maternal language behaviour.

3. Since the correlations of the Bernstein scales with reading score were so low, it was not possible to seek explanations for these associations in terms of overlap with the 'child reads to mother'variable.

Subsidiary findings

4. Allowing for the difference in incidence of 'child reads to mother' across social class and sex categories reduced the effect of these variables on reading attainment.

5. Schools have different policies regarding encouraging parents to listen to their children read, and parental practices appear to be influenced by these policies.

6. Mothers in the sample took a clear interest in how their children were being taught to read, and formed firm opinions on the subject. 72% expressed definite approval of children being given reading to do at home, and 25% objected to the use of i.t.a. to teach reading, specifically because it meant parents could not help their children.

CHAPTER FIVE

EVALUATION

The purpose of this chapter is to take a critical overview of the findings of the present study, and to examine them in the context of the very general queries with which the study began.

In brief, the study was concerned with identifying critical aspects of the home environment which varied within a working class population - Husen's 'proximal' or 'process' variables - and seeing if these could be related to school attainment differences within that population. The first sections of this chapter consider how far the study's aims were realised and the reliance which may be placed on its findings. Sections follow on the interpretation of the statistical results obtained, their practical implications, and a consideration of how far the findings could be generalised to other populations.

In Chapter Six, the wider implications of the study findings are discussed, particularly with respect to current thinking and practice regarding the education of working class children.

Achievement of Aims

The aspect of the study in which home background variables are related to school attainment is clearly the most attention-catching; so much so in fact, that the two less ambitious achievements of the project may tend to be overlooked.

The first, and most obvious, finding of the study was that children growing up in a socially and materially homogeneous area are already showing a very large range of individual differences in reading performance by the time they are seven years old. Since the consequences of early success or failure for subsequent school achievement are so well-documented (Bloom 76, Cockburn 73, Crawford 68, Douglas 64, Morris 66, Peaker 71) it is surprising that their antecedents are so poorly understood. How does it come about that, after the same two years of schooling, one child can recognise thirty words on a reading test, while another can only manage two or three of the simplest items? Differences in intelligence are probably important, but are certainly not the whole explanation.

Another fact which needs pointing out is that some children in this working class area were very good readers indeed. Discussion of low overall standards draws attention from this fact. Why have these children succeeded when so many of their classmates have conformed to the low standard traditionally expected of them?

These were the questions that the present study sought to answer.

The second stage in the search for answers to these

questions was to find out how much child-rearing practices varied amongst mothers in a working class area. Identification of relevant variables proved not to be difficult: mothers differed in their language behaviour, their aspirations, disciplinary methods, contacts with school, the amount of supervision they exercised over their children, and the amount of help they gave their children with school work at home. At one extreme were mothers who, when their children went out to play, did not know whom they were with, where they went, or for how long they would be gone. These mothers used television indiscriminatly to keep the children quiet indoors, maintained discipline by giving orders or threats of physical punishment, took no interest in school matters - to the extent of not even praising the child if he had done something well in school - never visited school, not even on Open Days, never helped with school work, and generally had as little to do with the child as possible. At the opposite extreme, mothers supervised their child's play activities very closely, kept a careful check on his television watching and used 'psychological' methods of discipline. They took a keen interest in their child's schooling, regularly discussing his activities with him, praising good performance, keeping in contact with the school and in touch with school work, and giving help with school work in the evenings at home. They answered their children's questions, talked with them often, and had high aspirations for their future careers.

The justification for using social class in studies of attainment is that it is a global index of 'similarity of lifestyle.' The above examples illustrate very strikingly

how different the lives of two working class children can be, and how much important information is missed if all that is known about a child's home background is the family's social class membership. Reference to this point is made again, later on in the section.

Considerable success was achieved in relating home background factors to school attainment. Language behaviour of mothers, aspirations, an inventory of 'child-rearing methods,' reading to children and listening to children read were amongst the variables which showed significant correlations with reading attainment. All these variables were, however, found to overlap, in the sense that the different questions tended to pick out many of the same mothers. When the various effects were disentangled, the factor which emerged as most strongly related to reading attainment was whether or not the mother reported that she listened to her child read.

Taking a number of home background factors into consideration, it was found that almost 40% of reading score variance could be accounted for, with the 'child reads to mother' variable alone accounting for more than 30%.

The main aim of the study had been to demonstrate the importance of home background factors in the determination of school achievement. Even so, the magnitude of the revealed effect was surprising. The children were only in the first term of their junior school career, but already about a third of their variation in attainment could be accounted for by knowledge of particular aspects of their home backgrounds; and this in an apparently socially homogeneous area too.

The importance of the 'child reads to mother'variable was particularly unexpected, since it has appeared only infrequently in the literature. The only explicit reference to it is in Morris (1966) when the design of the study made it impossible to separate out its effect from those of other factors contributing to variation in reading performance. Most investigations have paid no attention at all to the active role mothers can play in furthering their children's progress at school, concentrating instead on the passive role of the home in supporting and encouraging the school's activities. (This point is taken up in more detail in the next chapter.) It might fairly be said, therefore, that the identification of 'child reads to mother' as an important predictor of reading attainment is not only the principal achievement of the present study, but also a genuinely original contribution to the somewhat overcrowded literature on reading.

The range of social class, as usually assessed, was very narrow in the present study sample, being restricted with few exceptions to the various gradations of 'manual working class.' Despite this limited range, however, there was a social class gradient of attainment in the sample, which the study was only partially successful in explaining. There was a tendency for the different social class groups to have different approaches to child-rearing, but there was considerable variation within groups, and 'favourable' strategies were certainly not restricted to the upper strata. There was some evidence to suggest, for example, that the higher the social class, the greater the tendency for mothers to

listen to their children read: controlling for this difference reduced the social class attainment gradient, but did not eliminate it completely. The same was true of the other home environment indices available. Since the groups showed no significant differences in IQ, the residual social class gradient remained unexplained. Perhaps the answer lay in more subtle differences in the quality of the home environment - in the quality of the help given with reading, for example - or perhaps in the attitudes and expectations of teachers towards children from different social class groups. The problem remains unresolved.

(None of the other demographic variables studied, e.g., family size indices, or family circumstances, showed a relationship with achievement which was strong enough to merit further investigation.)

The Reliability of the Study Findings

The dictionary definition of reliable is 'can be depended on with confidence.' It is in this general sense that the word is used here, rather than in accord with its stricter mathematical definition. Were the variables in the study in fact measuring what they purported to measure? Was the study sample representative of the population of interest? Were the statistical findings replicable?

In the language of psychometrics, 'construct validity' describes ' the extent to which a test measures that which it purports to measure.' Standardised tests of intelligence and of reading ability were used in the present study; interpretation of the study findings must therefore take their construct validity into account, even if only in a non-technical way.

The validity of intelligence tests has given rise to far more debate than has that of reading tests. This position is reversed in the present discussion, primarily because the attitude to IQ adopted in the study has been from the very beginning one of ambivalence.

It is true that analyses were performed using IQ in its conventional role, i.e., as a measure of intelligence which must be 'partialled out' before analysis of other factors influencing attainment can be performed. In the present study, use of IQ in this manner did not imply acceptance of the traditional model's claims for the validity of IQ: rather, it was a matter of answering critics on their own terms. The main aim of the study was to demonstrate the effect of home environment on school attainment. Partialling out procedures were, therefore, performed to show that taking account of IQ differences did not eliminate

the claimed environmental effects, as might otherwise have been suggested. It was made clear on other occasions, however, that this sort of analysis was believed to be inappropriate, because environmental influences on IQ were also suspected; in such a case, partialling out of IQ effects would reduce the apparent influence of the environment on attainment.

In other analyses, such as the examination made of the relationship between certain environmental variables and IQ, the construct validity of the IQ measure was called more directly into question, to the extent of being made one of the study's subjects for investigation.

The construct validity of reading tests has not been subjected to the same widespread scrutiny as has that of intelligence tests, probably because they are explicitly measures of attainment, and attainments are less emotionally and politically loaded than are measures of 'intelligence.'

In the technical sense, the problems are the same; does the test of reading tap all the skills normally understood to be involved in the process of reading? This is not quite such a straightforward problem as it sounds, because authorities differ on the question of what skills a seven- or eight-year old must have acquired to be considered a competent reader for his age. Six-year olds require fewer skills to fulfil the same criterion, ten-year olds require more. It is not necessary to go into the finer points of the argument, however, to realise that currently available reading tests, and particularly group reading tests, cannot

be tapping more than a very limited range of the skills involved at each age. This is particularly noticeable at the youngest ages; the Southgate 1, for example, tests nothing more than the recognition of isolated words. No comprehension of those words is required. The NFER 'A', intended for slightly older children, does require comprehension, since the task is one of choosing a word to fit a sentence. Even so, the comprehension demanded is of nothing more taxing than single sentences, and quite short ones at that. The writers of the Bullock Report, referring to reading tests similar to the NFER 'A', expressed their opinion on the matter very clearly. "We do not regard these tests as adequate measures of reading ability. What they measure is a narrow aspect of silent reading comprehension." (D.E.S.75).

While severely criticising the validity of reading tests, however, the writers of the Bullock Report readily conceded that the tests were "technically reliable, in the sense that they measure the same features to the same degree on different occasions." It was, of course, this latter feature of reading tests like the NFER 'A' which had led to their use in the large-scale surveys referred to by the Bullock Report.

One of the factors contributing to the technical reliability of tests like the NFER 'A' is their objectivity; answers are chosen from a multiple choice array and scored according to pre-specified rules. This objectivity was of particular value in the present study, because the other possible means of assessment, such as teacher ratings might have been influenced by knowledge the rater possessed about

the children's home backgrounds.

The Southgate 1 and NFER 'A' were used in the present study for the same reason that tests like them were used in the big reading surveys - there was no alternative. Objectivity and technical reliability were essential considerations, ruling out any form of teacher assessment; individual tests such as the Neale, although tapping a wider range of reading skills, were ruled out for practical reasons.

It is possible that the aspects of reading skill which were not measured by these tests show a different pattern of susceptibilities to environmental influences. Further research is needed to find out. Until that time, however, it is necessary to remember that reading test score and the composite skill of 'reading ability' are two different things, and that generalisations from the former to the latter are based on untested assumptions.

It might be added at this point that research into the determinants of reading test performance could also be considered an end in itself. The instruments are inadequate to their task, but they are used in educational practice as well as in research: on a local authority scale, resources might be channelled to schools with particularly low test scores; on an individual level, school class placement and selection for remedial assistance may be decided on the basis of test performance. In these circumstances, improving understanding of the factors which influence test score is a very valuable exercise.

Having described the interpretations which are placed in this study on IQ and reading test performance, it remains to be asked if the test scores, as scores, 'can be

depended upon with confidence.' Standardised tests were chosen, amongst other things, for their objectivity, but it is worth asking if any element of bias could have slipped in unnoticed. In the case of the IQ tests, the answer is, probably none that could have been avoided since they were administered and marked by trained testers, who were familiar with none of the sample schools or their children. The situation was not quite so satisfactory in the case of the reading testing, since some of the test administration was carried out by class teachers. They had, however, been fully instructed in the procedures beforehand, with particular stress being placed on the importance of giving the children absolutely no assistance beyond the initial practice items. All test marking was carried out by the researcher. In the light of these precautions, it is considered that only negligible bias could have been introduced into the results from this source.

Care was taken over the administration and marking of tests in order to minimize the influence on performance of factors unrelated to the skill under examination. Some such influences are unavoidable, however, as they stem from superficial aspects of the design of the tests themselves. The NFER 'A' reading test was found to be particularly open to criticism on these grounds. Question 16 from the test is given below, exactly as it appears in the test booklet, to illustrate one very common problem:

> Jane looked after all the plants in the house, and she carefully.....
> .....every day.

The alternative responses were:

1. dug them up
2. chopped them
3. planted them
4. watered them.

Because the gap in the sentence spread over onto two lines of script, many children interpreted this to mean that two answers were wanted, not just one. Ringing two answers, of course, meant no mark for that question. This behaviour was often found to be consistent throughout the test; all items with a split 'gap' were given two answers; all items with the gap on one line only were given one answer. There is no provision made in the instructions for administering or marking the test to cope with this contingency.

The case might be made that good readers would know what was intended - but then the test is supposed to be one of reading ability, not making inferences about arbitrary conventions of test design.

Question 36, given below, is criticised on different grounds:

.....they ran out to play
football on the field.

The alternative responses given were:

1. With heavy hearts
2. Laughing happily
3. Swinging their rackets
4. Changing feet

If the author's own experience of school sports was being discussed, the correct answer would undoubtedly be 'With heavy hearts.' The NFER's experience was clearly rather different, because the only 'correct' answer is 'Laughing happily.'

These problems might appear trivial, but if a child was particularly unlucky, he might give two answers for all six 'split gap' questions, plus fall into the Qu.36 trap, and that of at least one other similar question. As a consequence, he might obtain a reading score which was a very inaccurate reflection of his reading ability; to

return to the definition of reliability, the assessment could not 'be depended upon with confidence.'

The magnitude of the distortion produced in the results by these effects is unlikely to be large. What is unfortunate is that more thought was not given to the construction and design of the test to ensure that such troublesome ambiguities could not arise.

Moving on to a discussion of the home background variables investigated in this study, it must be readily admitted that their reliability has not been properly established in either the general or the technical sense.

Taking the general sense first, the variables cannot be 'depended upon with confidence' to the extent of assuming that mothers actually behave as they say they do: they might be unwittingly deceiving themselves, or quite intentionally deceiving the interviewer. A very carefully designed study would be required to collect the observational evidence needed to test these possibilities.

As described in earlier chapters, a great deal of care was taken during the planning and carrying out of the interviews to minimise both the factors mentioned above; self-deception, it was hoped, was reduced by asking questions which were as 'concrete' as possible, and intentional deceit by a variety of devices, designed to reduce the social pressure put upon mothers to give an 'acceptable' response, and to eliminate clues as to the nature of that response.

Certainly these measures will not have been entirely effective. Mothers will have claimed they listened to their children read when in fact, they rarely did so; possibly some of the poorest readers in the 'child reads

to mother' category could be accounted for in this way.

It is worth pointing out, however, that some mothers were remarkably consistent in choosing the 'educationally favourable' response, when its identity was often far from apparent: if they were not reporting their real behaviour, it is hard to imagine how intentional deception could produce this pattern.

No mothers were interviewed twice, so it was not possible to estimate the equivalent of test-retest reliability for the home background variables. Split-half reliabilities were unsuitable, owing to the very disparate nature of the questions asked. There was, as a result, no direct check on the objectivity and accuracy of the information obtained. Stringent precautions had, of course, been taken during the preparation of the data: in particular, coding of the home background information was always completed before the reading data was examined. Further, in the main studies (but not the pilot,) criteria for category membership were clearly specified and laid down in advance of data collection. As has already been reported in detail (see, for example, page 263) doubt over category membership arose only very infrequently for any of the variables. Decisions had sometimes to be made on an ad hoc basis, but the rule adopted was always specified, and category assignment made, before any reference was made to the reading data.

The above precautions, amongst others, were taken during the collection and preparation of the home environment data, in order that the information obtained should be as objective and reliable as possible. The fact remains, however, that the success of this effort has never been rigorously tested, and further research on the subject

is certainly required.

Although of untested technical reliability, it was found that most of the home environment measures could be 'depended upon with confidence' in the sense that their association with reading attainment withstood replication. In the case of 'the child reads to mother' variable, for example, very similar results were obtained in the pilot study, in the model-building and model-testing phases of the first junior school study, and in the second junior school study. Whatever the combination of actual behaviour, wishful thinking and deliberate misrepresentation - not to mention coding unreliability - that is being picked up by this variable, the end-product is strongly related to reading test performance.

The association between 'child reads to mother' and reading score, it has been claimed, is reliable in the sense that it is replicable. The same cannot be said, unfortunately, of the relationship between reading score and the Bernstein scales. In the first junior school study, correlations between scale score and reading attainment were obtained which were similar in magnitude - about 0.3 - to those originally obtained by the Bernstein research team. In the second junior school study, however, correlations of less than 0.1 were obtained, although the procedure followed had been identical as far as could be ascertained. No satisfactory explanation has been found for the difference in the results.

Correlations of the Bernstein scales with Short WISC IQ were also carried out in the first junior school study.

Bernstein's team had obtained correlations of .19 and .38 for the 'Chat' and 'Awkard questions' scales respectively. (Brandis 74, per. comm.) The present study results were .18 and .10.

Further testing of the scales on other samples is required to see if the early promising results can be repeated.

The form of the scales used in the present study was that of a research instrument in the process of development. Their reported split-half reliabilities, for example, were only .47 for the 'Chat' scale and .43 for the early form of the 'Awkward questions' scale, (see page 255 and Brandis 1970) and these figures were themselves only obtained after making very large assumptions concerning the scales' interval status and factor structure.

The above problems with the scales were known at the beginning of the present study. Administering the scales to mothers during the course of interviews revealed further difficulties which had not been suspected. Mothers found the questions unrealistic, and would insist that they never chatted to their child whilst out shopping, because they never took him shopping, or that they would never be called upon to answer a question about war, because the child would never think to ask such a thing.

The most serious problem was encountered using the 'Awkward questions' scale, when it was observed that a large number of mothers responded to the two sex education items (see Appendix 4) in a manner which was quite inconsistent with their other responses. A mother, for example, might evade most awkward questions to the limits of her ingenuity,

but consider it a matter of principle that questions about sex should be given an 'open and frank' answer. This principle was stated in so many words on some occasions. Whatever the reasons for this - reaction against their own experiences perhaps - it did appear that many mothers did not consider questions about sex to be awkward in the same sense that questions about rules or wars might be.

The 'Awkward questions' scale was supposed to measure an aspect of a mother's approach to language and communication. If what is suggested here is true, some mothers' responses to two of the eight scale items were being strongly influenced by quite separate factors from those which determined the remainder of their test responses, and presumably their language behaviour in general.

It has been argued that the 'Awkward questions' scale is of dubious construct validity, because it seems to be tapping variables other than the one intended. Even if this is not accepted, and 'attitude to sex education' is somehow subsumed under 'willingness to answer awkward questions,' a criticism remains of the scale as a measuring instrument. During the scale's construction, the assumption was made that all scale items were equivalent; hence all items are given equal weighting in the calculation of the final scale score. At the very least, the findings of the present study indicate that this assumption is not valid.

It will be by now apparent that the Bernstein scales are inadequate and unsatisfactory measures of those aspects of maternal language behaviour which they purport to assess. As a result, it cannot be assumed that the analyses which examined the relative merits of 'child reads to mother' and

Bernstein scale score as predictors of reading attainment can be 'depended upon with confidence.' If the measure of language behaviour was inadequate, that variable's usefulness as a predictor of reading attainment cannot have been adequately evaluated, and neither can its predictive power have been fairly compared with that of other variables. Such comparisons will have to wait until better measures of language behaviour have been developed.

One final aspect of the study's reliability remains to be considered, and that is the extent to which the sample used was representative of the population in question. Since it was desired to find out more about the determinants of attainment amongst working class children, it is necessary to ask if the study findings can indeed be generalised to this population, or whether they are likely to be sample specific.

The various study samples, with the possible exception of the pilot study, were certainly representative of the catchment areas of the schools in question. Children were selected at random within schools (or all the children of the age in question were used as the sample, as in the pilot study) and the success rate of the interviewing was so high that negligible bias could result from this source. The various school catchment areas were also representative of the Dagenham estate as a whole, as far as could be assessed from the Census data. The possibility exists that the schools were not representative of Dagenham estate schools in general, because they were selected by the LEA, rather than being drawn at random by the researcher. Since it was possible to analyse attainment at an individual, i.e., within school, level, and at the same time to check that overall standards

were consistent with what would be expected for a working class area, it is unlikely that bias stemming from this source will have influenced the results to any material extent.

The numbers of children in the various study samples would have been increased, had practical arrangements permitted it. As it was, they were large enough to yield results which were replicable in the gross sense, if not in terms of numerical precision.

One feature of the design of the study must also be mentioned here. The children in the various samples came from right across the attainment spectrum, i.e., there was no selection of good and poor achievers, or any other sort of contrasting group. A problem with this latter type of design is that extreme groups may differ from the body of a distribution in kind as well as in degree, so that conclusions drawn about the former may not apply to the latter. The results of the present study are not open to this sort of criticism: the aim was to produce findings applicable to Dagenham schoolchildren, not Dagenham high- and low-achievers, and the samples used were consonant with this aim.

The findings of the present study could, with confidence, be applied to the population of Dagenham seven- and eight-year old schoolchildren. Whether or not they could also be applied to other working-class populations, or even to middle-class populations, is taken up in a later section of this chapter.

Interpretation of the Study Findings: Statistical Analyses

The results of the various statistical analyses carried out in the present study have been reported at considerable length in earlier chapters. It is the purpose of the present section to consider briefly some of the problems involved in interpreting results of this kind.

Statistical analyses can only yield, as an end-product, statistical information. A quantitative estimate of the degree of association between two variables does not in any way explain why that association exists, and attachment of meaning to such a figure, in the sense of suggesting underlying causal mechanisms, must be seen as quite a separate exercise from the figure's calculation.

Care is particularly required here if the danger exists of jumping to conclusions; for example, if an obvious interpretation of the data is in accord with either a previously established theoretical framework, or with the dictates of 'common sense.' An example of a lack of caution on the first count is the acceptance of a significant correlation between maternal language behaviour and children's school attainment as proof of a causal connection between the two variables. The present study, lacking any particular underlying theory, has few problems in this direction, but is much more at risk on the second count. The chief finding of this study - that of the strong statistical association between 'child reads to mother' and reading performance illustrates clearly the problem here, since its 'face value' explanation is a very obvious one: 'child reads to mother' represents practice at a skill and practice improves performance.

The intention here is certainly not to suggest that this interpretation is incorrect, rather to point out that quite different underlying processes could yield the same statistical end-product. The IQ argument already given in Chapter 3 is a concrete example of this kind of thinking: high IQ children, it was suggested, are both more likely to read to their mothers and to be good readers - no other link between these two variables need be postulated. As will be recalled, this particular theory had to be rejected as an explanation of the study findings, when it was found that a highly significant 'Help' effect remained even after the fullest allowance had been made for the influence of IQ.

Similarly, the other home environment indices did not explain the 'Help' effect - rather the reverse.

Other possible explanations are considered below. (For reasons of space, discussion is limited to interpretations of the association between 'CtoM' and reading performance, since it is the most important of the study's findings. Very similar arguments could also be applied to a number of other analyses.)

One way of approaching the question is to classify alternative explanations under two headings: those which propose some characteristic of the mother as being chiefly responsible for the observed statistical association, and those which propose some characteristic of the child.

To begin with the former, it may be the case, for example, that it is only very special mothers who persevere with helping their children at home in the face of unhelpful or even antagonistic behaviour from the school. It is possible

that these mothers are particularly educationally aware, and have an approach to child-rearing which is favourable in very many ways. The high reading performance of their children could, in these circumstances, be the product of a large number of interacting variables. Alternatively, it may be the case that a single, as yet unthought of, variable is responsible for the apparent effect of the 'Help' factor, in the same way that the latter was put forward as an 'explanation' of statistical findings resulting from the use of the Bernstein scales.

An intervention programme which sought to increase the number of mothers listening to their children read would provide useful information here. If the original 'practice improves performance' theory is correct, then the prediction would be that persuading more mothers to listen to reading would lead to an improvement in the children's reading performance. On the other hand, if either version of the 'mothers who help are special' theory is correct, then merely encouraging 'ordinary' mothers to help would not be expected to influence performance to the same extent. In the extreme case, if the apparent effect of the 'Help' factor observed in the present study was altogether an artifact of the action of other variables, then no significant change in performance would be expected.

In the absence of the empirical evidence that such an experiment would provide, it is the opinion of the present writer that the extreme version of the above argument is unlikely to be true, but that the moderate version has much to commend it. It seems quite likely that at least some of the mothers who provided help on their own initiative were

providing their children with other out-of-the-ordinary educational advantages too. 'Ordinary' mothers who just adopted the practice of listening to reading, but who did not also provide these other advantages, would not be as successful in raising the level of performance of their children.

To take an extreme example, in the present study, families which fell into the 'never helped with reading' category gave, on interview, the impression of conferring on their children many other educational disadvanges in addition to the one named. Getting mothers from such families to listen to their children read - if that could somehow be achieved - would probably solve only a very small part of the educational problem posed in such cases. Research is clearly required to test these predictions.

Moving on to consider characteristics of the child as possible explanations of the association between the 'Help' factor and attainment, one characteristic which teachers in particular might see as important is the child's interest in learning to read. By analogy with the IQ argument, childrent who want to learn to read are both more likely to become good readers and also to participate in practice sessions at home. In the extreme, it could be argued that practice sessions are irrelevant, and that 'interest is all' - i.e., that the children who are prepared to practise at home are the ones who are so highly motivated that they would become good readers anyway.

The more moderate version of this argument is really a qualification to the originally proposed explanation, rather than a true alternative, because it is still the occurrence of the practice sessions which is said to matter for perform-

ance, rather than the child's interest per se. That interest, however, is seen to be vital, because an uninterested child will not accept his mother's offers of help, and if practice sessions do not occur, performance cannot thereby be improved. Interest alone will aid performance, in that the child may learn better in school, but the extra practice improves performance still further.

The two arguments given above differ fundamentally: the less extreme claims that interest plus practice at home raises performance more than interest alone, the other claims that the extra practice makes no difference.

In the absence of the empirical evidence needed to decide the issue, it is the opinion of the present writer that the 'interest plus practice' argument is much the more plausible of the two. It is also an improvement on the original interpretation, because it draws attention to the important proviso that practice sessions will not occur unless certain conditions are met. It should, however, be pointed out that in this discussion, a very simplistic notion of 'interest in learning to read' is being employed. Such interest is not, as might have been conveyed, a static quality, nor one which is brought into being solely as the result of the activities of teachers. Parents can create interest too, not least by involving themselves in reading activities with their children at home. The process is a dynamic, not a static, one.

It is of interest here to pursue briefly the question of the evidence which would be required to decide between the extreme 'interest alone' and 'interest plus practice' arguments, and to see if the present study data provides

any information of relevance to this issue.

In order to separate out the factors of interest and practice, it would be necessary to compare the reading performance of three groups of children: those who are not interested in reading and receive no help; those who are interested but receive no help; and those who are interested and who do receive help. (The fourth logical category - help, no interest - is omitted, since it is assumed that without interest there can be no help of the type in question.) Unfortunately, the present study data cannot be applied directly to this problem, as it could in the case of IQ, because 'children's level of interest in reading' was not assessed as a separate variable. Even if questions on this topic had been put to mothers, the information so obtained would have been inadequate. At best, mothers could only have given an accurate report of their child's behaviour at home, whereas it was behaviour in the school context which was one of the main points of the argument. Interviewing of teachers, or even of the children themselves, would be necessary in any future research into this subject.

The most which can be extracted from the present study data is circumstantial evidence. Reference is made here to Figure 64, the stratified histogram obtained when the reading data from the first junior school study was plotted by 'child reads to mother'category. (Page 350) If the main factor influencing performance were the child's interest, rather than reading to his mother, it might be predicted that at least a few 'high flyers' would be found in the 'no help' category. That prediction is not confirmed. Further, although it is not possible to separate out from

the 'no help' group those children who are interested in reading, it is clear that either there are very few of them, or that their mean level of performance is indeed below that of the 'interest plus help' group. Defenders of the argument that 'interest is all' would have to concede that the great majority of interested children do seem to practise at home, (which raises the possibility that 'interest' leads to high achievement primarily because interested children practise at home.) If this is indeed the case, then the claim that interest is all becomes very difficult to test, since so few children are to be found in whom the two variables are not confounded. In these circumstances, an intervention might be the only way to decide the issue - children matched for interest, randomly allocated to 'help'/'no help' groups, for example.

All the 'alternative explanations' considered up to now have invoked the existence of one or more additional variables to explain the association between the 'Help' factor and reading performance. When characteristics of mothers were being considered, it was suggested that as yet unexplored aspects of the mothers' behaviour might be acting to raise reading performance, and the 'Help' variable only appeared to be influential by association with these other variables. When characteristics of the child were being considered, it was suggested that reading to parents and being a good reader were associated because both variables stemmed from a common antecedent (e.g., high IQ, or an interest in learning to read.)

Other alternative explanations do not suggest the action of additional variables. For example, it can be

argued that high reading achievement itself leads to increased reading to parents at home, rather than the reverse. Selective processes which might be operating here are: parents of good readers take an increased interest in their children's progress; good readers are more willing than poor readers to display their accomplishments by reading out loud; schools act selectively in permitting only certain children to take reading material home - perhaps just their good readers, or children from trustworthy families.

The operation of any, or all, of these processes - and others besides - could lead to a statistical association between the 'Help' and reading performance variables. (Almost the only possibility that can be completely ruled out is that the two measures are tapping the same underlying variable, as is sometimes suggested when two measures are taken on the same individual. Here, the 'Help' variable is an index of the mother's behaviour, and the Reading performance variable an index of her child's behaviour.) It will have been noticed, however, that the arguments presented here have been artificially polarized: reading to parents does, or does not, make a difference to reading performance. The data of this study could, in theory, have been obtained even if regular reading practice at home with parents made not the slightest difference to reading performance. School and individual factors could have been all-important, and occurrence of reading sessions at home quite irrelevant. Although both learning theory and common-sense suggest that this is unlikely, it must be recognised that such an interpretation will probably appeal to many teachers and educational theorists, who have, after all, closed their eyes in the past to the possible

implications of parental involvement in children's learning.

A general point which can be made here is that a critical attitude should be brought to the interpretation of all statistical findings, not just the unexpected or uncomfortable ones. Stating a hypothesis in advance of all data collection does not remove this responsibility, nor does using a comparison group rather than a correlation design. A significant correlation between maternal language behaviour and school attainment is not proof of a causal connection between the two, but Bernstein has not been taken to task for assuming it is. Just as IQ, it is said, must be taken into account when interpreting a correlation between home environment and school success, so should home environment be taken into account when interpreting the correlation between IQ and attainment. Many high achievers have a high IQ and a helpful home: to interpret the achievement/IQ correlation without reference to the helpful home is as negligent as to ignore IQ and explain attainment variation by reference to home environment indices alone. While the latter, however, would be regarded as very bad educational research, the former goes on all the time.

IQ and favourable home environment factors overlap to a quite unknown extent in most school populations; yet knowledge of the size and significance of this overlap is crucial to the understanding of variation in attainment. 'Shared variance' cannot conveniently be forgotten when making claims for the explanatory power of one variable - for instance IQ - but emphasised (in the guise of 'allowing for IQ') when seeking alternative explanations for potentially

controversial home environment effects.

To summarise: it is fully recognised that the findings of the present study - notably the Help/Achievement correlation - are open to a number of alternative explanations. Although it remains the author's view that the face-value interpretation of this finding is still the most plausible, a consideration of alternatives aids understanding and serves to temper strong claims, i.e., it seems quite likely that some of the association between Help and Achievement may be accounted for by processes other than that of 'practice improves performance.' The general point may also be made that time spent considering alternative explanations is not only worthwhile in controversial cases - rather that insufficient time is spent doing it in the less controversial areas of educational research.

Interpretation of Study Findings: Practical Implications

For all of the reasons argued above, the simple bivariate correlation coefficient of the 'Help' variable with attainment cannot be considered as an estimate of the extent to which achievement level could, even theoretically, be changed by manipulating the 'Help' factor. The simple bivariate coefficient necessarily reflects a certain amount of 'shared variance,' and selection effects probably also operate to some extent. In such circumstances, probably the only way of testing the 'real world' significance of the Help/Achievement correlation is to bring about a real world change and measure the consequences. In the meantime, however, one possible way of thinking about the practical implications of the study findings is to use the idea of limiting factors. If, for example, interest and extra practice both contribute to reading performance, which of the two is setting the upper limit to progress? Are there children who would be willing to practise their reading at home, but are not given the opportunity; or are there more mothers offering to listen than children willing to practise?

The idea of a limiting factor can be applied at the level of individual children, as well as at the level of a school population. Thinking at the individual level emphasises that in each mother-child pair, the occurrence of a session of reading practice is the result of an interaction: a highly motivated mother may successfully coax an uninterested child; an enthusiastic child may refuse to take his mother's 'no' for an answer.

Discussion of the limiting factor in a school population will necessarily be a generalisation, but one which can

usefully be made when questions of policy arise. If, for example, there is to be a campaign to raise the reading standards in a school, the most suitable course of action will differ, depending on whether there are more willing mothers or willing children. A low level of interest amongst the children might suggest expenditure of resources on the school - new books, or more courses for teachers - but it might also suggest giving mothers advice on how to build up interest, or on how to improve their technique, perhaps by giving more praise or being more patient. Action directed at mothers would also, of course, be suggested if there was 'untapped' interest amongst the children, i.e., interested children were not being given the opportunity to practise at home. This itself might come about for a variety of reasons. For example, a mother might be willing to listen to her child read, but deterred by a lack of suitable materials, or a hostile attitude from the school, or insufficient conviction that her help would be of any value. On the other hand, she might simply not be interested in her child's educational progress, or interested, but unable or unwilling to spend her time on activities such as reading practice.

Clearly, choice of the correct course of action would depend on the prior identification of the limiting factor in a particular case - once again generalising when the 'case' is a school population and not an individual child. If mothers are not helping for any reason other than the last two mentioned, then it would seem to be within the power of schools to change matters for the better.

Since it would certainly be expected that different types of area would be characterised by different limiting

factors, it is of interest to ask if the present study data provides any clues as to what was happening in Dagenham. Once again, the evidence is indirect. Turning this time to the results of the second junior school study, a striking finding is that substantially fewer mothers listened to reading in the juniors than had done so in the infants. Although the reason for this was not certain, there were a number of suggestions that school policy was in part responsible. Infants schools, for example, commonly sent class reading books home; junior schools did not. Mothers, when questioned, often expressed a willingness to listen to reading, but said they were now rarely called upon to do so because "he only brings his book home now and again in this school." The objection might be raised that mothers' expressed opinions and their actual behaviour are two different things. This is true, but an explanation is still required of why so many mothers, who were prepared to back their opinions with action when their children were infants, simultaneously stopped doing so when those same children entered junior school. It is the school which sets the fashion in these matters. Mothers who express the belief that eight is too old for reading aloud would perhaps falter in that belief if such reading assignments were regularly sent home from school.

Another possibility is that the junior school children in this study did not bring books home because they did not want to; but here again, the same argument applies. Some children may genuinely flag in interest; others may flag because it is the fashion to do so. If the school were firm in its conviction that reading books should go home and be

read, and supported that conviction with consistent practice then fewer eight year olds would feel that reading aloud at home was no longer for them. Whatever the details, it seems altogether likely that, for many families, encouragement and assistance from school are necessary to sustain the habit of children reading aloud at home. Furthermore, before falling back on the excuse that the children are no longer interested, schools should make quite certain that they themselves have not made this lapse both easy and acceptable.

Further research is required to test these ideas. The present study, for example, only touched very briefly on the subjects of why and how schools try to discourage parents from helping their children with reading: very little is known about the range of practices schools employ in this respect, or how they justify them, or how practice and justification relate to the social class composition of the school catchment area.

In the above discussion, it has been argued that practising reading with a parent at home seems to be helpful to children when they are learning to read. One very important question which has not yet been considered, however, is whether parental help is somehow special, or whether help from some other person would do just as well. Only simple arithmetic is required to demonstrate that a teacher with a class of thirty children must spend a very limited amount of time each week listening to any one child read. In these circumstances, children whose parents also listen to them read are being afforded very valuable extra opportunities for practising their reading skills, and, as learning theory

would predict, practice improves performance. It is, therefore, reasonable to ask if giving children extra time and help with reading in school, perhaps on an individual or small group basis, would lead to gains in performance equivalent to those made by children receiving help from their parents. Both types of help would involve an increase in reading practice time, but there would be other differences: if teachers, as opposed to classroom aides, gave the extra help in school, they would bring to the task the advantages of a professional training. Help from parents, on the other hand, might be expected to confer substantial extra advantages in terms of motivation - the child sees that his parents are interested in his work and want him to do well, so he works harder in order to please them. An experimental comparison of the two types of help would provide very valuable information here.

Generalisation to Other Populations

The present study findings, it was stated in a previous section, may be applied with confidence to Dagenham seven and eight year olds in general. It is important as a next step to consider the implications of the findings for populations beyond the one studied.

In social geography terms, generalisation in two directions might be possible: to the urban working class, 'inner city' populations in particular, and to the middle class.

In material terms, Dagenham bears more resemblance to some middle class areas than it does to the deprived working class areas portrayed in the NCDS document 'Born to Fail,' for example, (Wedge & Prosser 73.) There is no overcrowding, no lack of basic domestic facilities, no material decay. It has been found by previous workers, however, that as far as the child and his education are concerned, material circumstances are much less important than the attitudes and behaviour of his parents. (CACE 67, Davie et al 72.) Further, these characteristics remain remarkably stable when the material environment changes, (Willmott & Young 60, Goldthorpe et al 69.) It appears, in fact that certain attitudes to education and methods of child-rearing are very deep-seated features of a working class way of life, and as such, are uninfluenced by the material environment, except perhaps in the cases of the most extreme deprivation.

The present study found that, in the Dagenham population, there was a high level of interest in education, but that some indices were more revealing in this respect than others. Parents were concerned about homework, and willing to help with school work at home, but had little contact with the

school itself, for example. It is of particular interest in the present context that the working class families in the Plowden survey, who were drawn from all parts of the country, showed a very similar pattern of behaviour, and so did the working class West Indian families studied in South London by Sturge (1972) and by Rutter and colleagues (1975).

In the light of the above evidence, it is not unreasonable to suggest that more detailed aspects of the present study findings may also be applicable to other working class populations. Further empirical study is clearly required to test the validity of this proposition.

Generalisation of the study findings to middle class populations would probably not be justifiable. The aim of the study was to find factors in the home environment which varied within a working class population, and to relate these factors to school attainment. The 'child reads to mother' variable was found to be a useful predictor of achievement in these circumstances. It is quite possible that, in a middle class area, the practice of listening to children read is so widespread that it fails to meet the first requirement for a useful predictor, i.e., that it should discriminate amongst members of the population being studied. It is possible for a variable to be responsible for an overall raising of standards in a population, and for the same reason to be a poor discriminator within that population. As a consequence, within a middle class area, other home environment factors might be more strongly related to reading success than 'child reads to mother.' It might even be the case that home environment predictors are eclipsed by IQ in a middle class area.

This topic would certainly repay investigation: do middle-class parents give more help with reading, as has been supposed; is the help more effective than that given by working class parents; what materials are used? If allowance is made for all these factors, is the social class achievement gradient reduced?

One important consideration remains to be mentioned, and that is the applicability of the present study findings to families where the parents have an imperfect command of English. The EPA survey in Birmingham revealed that the level of interest in education amongst families of Asian origin - mainly Indians and Pakistanis - was high. (Payne 1974) It can only be supposed, however, that the sort of active help which such parents could provide would be limited by their own command of the English language. It may be the case that quite imperfect English is sufficient for a parent to be able to provide help in the initial stages of reading, although a lower limit must exist. Once again, further research is clearly needed.

The extent to which the study findings may be generalised to different social groups has been discussed in some detail. Only brief mention will be made of the other possibilities for generalisation.

It seems unlikely, for instance, that the findings will have applicability beyond a fairly narrow age range. The importance of active help with school work from parents must diminish as the child grows older. It would be expected, furthermore, that this decline would be particularly pronounced in a working class area. The relative contributions to school success of active involvement and passive support

from parents are discussed further in the chapter which follows.

Finally, it is necessary to ask if any factor stemming from the school could limit the importance of the 'child reads to mother' variable. Certainly none of the schools studied here used methods of teaching reading which would make it difficult for parents to help - ita would be such a method, for example. Unless special efforts were made to overcome the problems raised in these circumstances, active help from parents would almost certainly diminish in importance, and the present study findings could not be applied.

CHAPTER SIX

OVERVIEW AND DISCUSSION

"What are the differences of family environment underlying the closer dependence of school performance on home background than on IQ?"

The above question was asked more than fifteen years ago in a well-known paper by Jean Floud entitled, 'Social Class Factors in Educational Achievement.' (Floud 61.) In 1961, no-one could answer Floud's question and, despite the concern which the subject aroused and the research effort it generated, there is still no satisfactory explanation available today.

Husen (1972), reviewing the research literature on the subject, noted with approval a shift from the study of 'frame' variables such as social class, to that of 'process' variables, such as the mother's language behaviour, and anticipated that the latter would yield improved correlations with attainment. In the first chapter of the present study, where a detailed account was given of this quest for 'process' variables, it was pointed out that a number of studies had succeeded in identifying variables which correlated highly with achievement, but that they had still not provided an answer to Floud's question, because little or not attempt had

been made to separate out the 'differences of family environment' which actually contributed to the determination of school achievement from those which were only indirectly associated.

To illustrate this point: it was possible in the present study to use mothers' replies to a number of different questions as predictors of attainment, with statistically significant results. In a small scale study, such as this one, it was impossible not to notice that the various questions were picking out many of the same mothers: was a particular child's reading ability the product of his mother's language behaviour, her interest in his school progress, her middle-class methods of child rearing, the reading model she provided, or her help with his school work. Some mothers had all five attributes. While it is certainly possible that all five were process variables in the sense that they all uniquely contributed to performance, it is also possible that some had very little influence in their own right, but could appear to do so because of their association with others. If the present study analysis is correct, for example, the reading model provided by a mother may be such a spurious 'influence': if a mother is herself a keen reader, but takes little interest in the reading of her child, then the child's performance does not seem to benefit.

Further attempts at 'disentanglement' of the study variables led to the emergence of the 'child reads to mother' variable as the most powerful predictor of attainment. It was found that, after account had been taken of whether or not a child regularly read to his mother, only weak relationships remained

between the other variables and attainment.

It may be seen, therefore, that the present study followed in the footsteps of earlier work, to the extent that it demonstrated the powerful influence of home background on school attainment, and identified variables within that environment which showed stronger correlations with achievement than did social class. It then went further and established first, that the 'process' variables identified did actually contribute to the social class effect, i.e., controlling for them reduced the class gradient in attainment, and second, that not all the apparent process variables in fact had a unique contribution to make to the prediction of attainment.

It is argued here that this last-mentioned step is an essential one if the true determinants of attainment are to be recognised. An opposite case may also be made however. In exploratory research, pooling predictors rather than teasing them apart has the advantage that it usually yields a higher 'percentage of variance explained,' which is desirable if the purpose of the exercise is to demonstrate the magnitude of the home environment effect, rather than explain it. The argument may also be advanced that attempting to discriminate amongst a battery of home environment predictors is rather like searching for the 'philosopher's stone' - the key variable which will explain the effect of home environment on achievement. Since, on this view, a whole constellation of interacting attributes of the home will influence achievement, separating out different components must necessarily produce a distorted and over-simplified picture.

It must be admitted that there is some truth in this

argument; no single factor is going to be found which is the key to school success. There is also a danger, however, in going too far in the opposite direction, and failing to discard variables which provide false explanations - false in the sense that the variables themselves play no direct part in the determination of attainment, but are associated with other variables which do.

If the findings of research are to be used as guides to action, i.e., as the basis of intervention programmes aimed at improving school achievement, then some attempt at 'disentanglement' becomes a pressing need.

Unfortunately, many research projects are carried out in such a way that the separating out of predictor variables is not possible. This is obviously the case if, for instance, only one type of variable is studied at a time, as in some of the Bernstein studies (e.g. Bernstein & Young 67, Brandis & Henderson 70) but it is also a drawback of any study which uses the method of comparison groups: with this design, it is not possible to study the inter-relationships amongst predictors, or to hold one predictor constant while examining the effect of another.

Morris's (1966) comparison of 'good' and 'poor' readers is a case in point. As was noted in the introduction to this report, Morris's study was the only one in the literature to show that 'good' readers were much more likely than were 'poor' readers to have parents who listened to their reading. However, the 'good' readers parents were also more likely to belong to higher socio-economic groups, to be library members and to possess books of their own. Separating out these various factors was not possible, and the strength of the relationship between attainment and active parental assistance

went unrecognised.

In the present study, the emergence of the 'child reads to mother' variable as a powerful predictor of achievement was unexpected, largely because it had received so little attention in the literature. What was even more surprising, however, was that it was a better predictor than maternal language behaviour, as assessed by the Bernstein scales, and further, that the effect of the language variable on attainment could be almost entirely eliminated by controlling for the 'child reads to mother' effect.

These findings have implications for a number of topics of wider controversy.

'The supportive home.'

Another way of asking the question which began this chapter is to enquire, what is it that good parents do which favourably influences the school attainment of their children? If the above findings are correct, it seems that at least as far as reading is concerned, what they do is more than provide a 'supportive home,' with its implied passive role for parents; they also actively intervene in their child's efforts to learn. According to the 'supportive home' theory, children will do well if their parents encourage them, show an interest in education and have high aspirations for their school progress. These parents will also read themselves, set a good example by joining the local public library, and provide stimulating reading material around the home. The central theme of all this is that the parents support the activity of the school, but are essentially inactive themselves.

Even the work of Bernstein, far more sophisticated

though it is, fits into this pattern: maternal language behaviour is correlated with attainment because, it is suggested, it influences the child's customary modes of thought, and through them his educability. To put it less scientifically, some mothers produce children who are good educational raw material, and others do not.

The belief that the role of parents in education is one of passive support for the school underlies all the major research reports on the subject; the Plowden and Bullock reports, the National Child Development Study, and the National Survey carried out by Douglas and his associates are important examples (C.A.C.E. 67, D.E.S. 75, Davie et al 72, Douglas 64.) In none of these studies was the possibility of an active parental contribution considered worthy of investigation.

Turning specifically to reading research, by comparison with the enormous amount of time and effort which has been spent investigating the teaching of reading, home environment effects on attainment have often been either ignored completely, or at best paid a very superficial attention, with 'supportive home' models being widely adopted by reading experts. The following is a good illustration of views held:

"..... the home background, both in its material and its psychological provision, can profoundly augment or interfere with the preparation of the child for reading and his subsequent efforts in reading lessons.

Parental attitudes and reading approaches which sustain interest, preserve confidence and foster the pupil's power of application and persistence, make no mean contribution to progress in reading." (Schonell and Goodacre 74.)

No shift in reading research emphasis is made necessary by the adoption of a 'supportive home' theory, since the method by which reading is taught is still seen to be of paramount importance. The present study findings are a different matter, however, for they draw attention away from the teaching of reading towards the learning of reading. This is not just a semantic point: by definition, the former is about what teachers do, and a preoccupation with that is only justifiable if all that a child learns about reading is what he is taught by his teacher. (Supportive home theories fit in perfectly here.) The present study findings suggest that many children learn a lot about reading from sources other than teachers in school, and further, that this 'home' contribution is a much more important determinant of attainment than has hitherto been suspected. (Using the criterion of variance explained, it certainly seems to be more important than any teaching method variable studied up to now.)

The 'supportive home', social class, and interest in education

It is well established that the 'supportive home' described above is much more common in the upper than the lower social classes. Working class families are, according to tradition, not very interested in the education of their children, and the children's attainment suffers in consequence.

In this context, the level of active involvement in their children's learning reported by parents in Dagenham is quite remarkable: about a half of top infants' parents said that they regularly took the trouble to listen to their children's reading, and more than a third were still

providing some help in the juniors. Further, in the families where help was given, the children did not exhibit the pattern of low achievement usually associated with a working class background.

Amongst the mothers who stopped helping in the juniors were a number who expressed a continued interest in helping, but who felt the need for some encouragement or support from the school. If all these mothers are to be believed, then the level of interest in reading progress amongst Dagenham parents is very much higher than would be expected on the basis of previous research.

Willmott studied the Dagenham estate in 1963, and concluded that one of the reasons for the poor academic showing of its children was their parents' lack of interest in education. Unfortunately, Willmott's index of 'interest in education' appears to have been a rather vague one, based on information gained during 'open and unstructured' interviews with parents. Further, if the examples Willmott gives are any guide, discussion on the subject was limited to parents' desires that their children go to grammar school, or stay on at school beyond the legal minimum age.

While it may be the case that a change of attitudes has taken place in recent years, it seems more likely that different impressions have been obtained in the two studies through the use of different indices of 'interest in education.'

The findings of both studies on the subject are in need of confirmation. In the meantime, however, it is reasonable to ask why the 'help with reading' index should suggest a higher level of interest in education amongst working class

parents than other indices which have been more frequently used in educational research, such as parental aspirations, or visits paid by parents to school.

Indices of 'interest in education.'

When working class parents' interest in education was discussed in Chapter 1, the literature on the subject was found to be complex and incomplete. Large scale surveys such as the NCDS, the National Survey of Health and Development, and the survey of parental attitudes carried out for the Plowden Committee found marked social class gradients when interest in education was assessed on a 'visits paid to school' basis. On the other hand, studies in which working class parents have been questioned in detail about their children's education have produced evidence of much higher levels of concern and interest than the above index would suggest. (Keller 63, Rutter et al 75, Sturge 72, Green 68, Young and McGeeney 68, McGeeney 69, Jackson 64, Watt 74, Payne 74, Schools Council 68, Aiach and Willmott 75.)

No study seems to have checked, unfortunately, that the various indices of 'interest in education' which have been devised show sufficient inter-correlation to justify the common practice of discussing that interest as though it were a single psychological entity. The 'Young School Leavers' and Plowden surveys were particularly well equipped to do this, as a number of different indices of interest had been used in each. A systematic study of inter-correlations was not made in either case, however.

In the Plowden survey, for example, information was collected on parents' desire that their children be given school work to do at home, as well as on their educational

aspirations, and the visits they paid to school. The last two measures yielded noticeably steeper social class gradients than did the first. Unfortunately, the analysis procedures used on the Plowden data involved pooling home environment indices together, not teasing them apart, so inter-relationships amongst individual interest measures, social class and school achievement went uninvestigated.

In the Young School Leavers Report, (Schools Council 68) data was gathered on the visits paid by parents to school, and also on their opinions about the functions of schooling and the value of various school subjects. Parents of 'young school leavers' were found to place great importance on the acquisition by their children of competence in the basic skills of reading, writing and mathematics, which they perceived as indispensable for 'getting on' in a career and in life generally. Despite these favourable attitudes, however, parents of young school leavers were found to have few contacts with the school, other than attendance at annual Open Days. Examination of the correspondence between favourable attitudes and visits to school was unfortunately not carried out, so the adequacy of the latter as an index of the former was not checked.

It is suggested here that the reliance in much previous research on a limited range of indices of interest in education has led to an under-estimation of the importance attached to some aspects of schooling by working class families. This is not just an academic point. Goodacre, (1968a) for example, found that teachers perceived parental interest as a very important determiner of school success, using as their criterion of 'interest' whether or not the parent

visited school. If a child's parents were never seen, teachers build up a picture of his home background which influenced their expectations of what the child could achieve. A number of examples are to be found in the literature of teachers complaining about parents' lack of interest, having apparently based their judgements solely on a 'visits to school' criterion. (Goodacre 68a, Mays 62, Young & McGeeney 68, Jackson 64.) Convenient measure though it obviously is for teachers and research workers alike, parental willingness to visit school is only one of the possible manifestations of 'interest in education.' It is suggested here that in a working class area, visiting school is a particularly bad choice as a criterion, because mothers will fail to visit for reasons other than lack of interest; for example, social discomfort, or a feeling of having nothing to contribute. In other words, while Open Day attendance or similar may correctly be interpreted as a sign of favourable attitudes, the opposite is not necessarily true. Some of the findings in the Young School Leavers report and in work by Jackson lend weight to this belief. If the day-to-day attitudes and behaviour of a mother are educationally favourable, then that is presumably what matters. The present study provides some evidence in support of this idea, but more research is clearly required.

Other points in similar vein can be mentioned. For example, there is no reason why a parent cannot be interested in some aspects of education but not in others. As the Young School Leavers report has shown, limited educational aspirations, in the sense of not wanting a child to continue at school beyond the legal minimum age, are not

incompatible with genuine concern that the child acquires basic numeracy and literacy skills. No study has investigated directly the inter-relationship of attitudes such as these, but many assumptions have been made about them when research in related areas has been planned and interpreted.

In the present study, mothers were encountered whose horizon of aspiration was that their child should "get a trade" or "not end up in a dirty job like his Dad." Swift (1967b)and Goldthorpe and colleagues (1969) found very similar opinions expressed by members of their working class samples. Going into the matter in more detail, the Goldthorpe study found that its working class families had few aspirations in the sense of changing their social status, but were greatly concerned with material advancement. What is important here is that these attitudes are quite consistent with indifference towards selective or higher education - why else take 'O' levels if not to get a non-manual occupation - but also with concern about basic skills; getting an apprenticeship is necessary to enter a trade, and that requires some element of literacy. As has been described, the working class parents interviewed for the Young School Leavers report recognised these facts very clearly. (They also conveyed their concern for literacy and numeracy to their children; the latter, when questioned, agreed that the purpose of schooling was to get a good job, and that the chief function of school was to produce pupils who were competent in the 'three Rs.') It may be the case that some of the parents in the Plowden survey who had low aspirations but still wanted their children to be given homework were motivated by such considerations, since homework in the

primary school was probably seen as practising the 'three Rs.'

It is worth mentioning as a final point on this subject that 'interest in education' and high aspirations are two of the three most commonly suggested characteristics of a 'supportive home.' The third is the home's 'cultural level,' by which is meant the reading habits of the parents, the number of books they possess, library membership and so on. First of all, it is by no means self-evident that these various attributes are closely associated with one another - systematic studies are lacking of how the 'cultural level' of a home is related to aspirations, and to active or passive support of educational aims. In any comparison across social class, the variables are probably quite strongly related, but within class comparisons are a different matter. It is, for example, a middle-class assumption that a capacity to read leads to an enjoyment of reading, and hence to reading as a leisure time pursuit. The standard survey questions about library membership, books in the home, and the quality of newspaper read are all based on this assumption.

It is suggested here that it is possible to place great value on reading as a skill, without deriving any enjoyment out of reading for leisure. Just because a mother prefers to spend her evenings knitting or watching television rather than reading in no sense implies that she does not consider reading to be an indispensable skill for herself and her child. To be an illiterate is something to be ashamed of in any social class, as the current Adult Literacy Campaign has clearly demonstrated.

Looking at the problem the other way round, just because a mother is herself an avid reader of Dennis Wheatley novels does not mean that she is necessarily prepared to take much

interest in the reading progress of her child. In the present study, 19 mothers out of 33 who were themselves keen readers provided their children with help; 28 out of 67 'non-keen' mothers did so. These figures provide no evidence of a statistical association between the two variables. Further, to the extent that a mother just reads herself and does not help her child, then the child's reading progress does not seem to benefit. This is difficult to explain on a passive 'supportive home' theory. (It should be added, of course, that the interaction of the various factors and their influence on attainment might be expected to change as the child gets older; perhaps a reading model at home, or parental aspirations for higher education become advantages in themselves for a secondary school child.)

In his summing up of the Plowden findings, Peaker (1967) expressed optimism that the parental attitudes found to be so important for attainment might be open to persuasion, hence raising standards. Bernstein and Davies (1969) criticised this conclusion: attitudes to education, they said, are a sociological function of social class, and therefore not likely to be modifiable. It is suggested here that not all parental attitudes to education are the tied functions of social class that these authors would suggest. Some attitudes might be, such as aspirations for higher education as a means of entry to the middle class; others, such as a concern for reading competence, probably cut across class boundaries. If parents can be persuaded to translate their concern for literacy into positive action, thenPeaker's optimism may be shown to have been well-founded.

Parental involvement in school work at home.

The last few pages have been devoted to discussing why it should be that so many mothers in Dagenham were helping their children with reading, when working class families traditionally take little interest in education. This is an educational researcher's question. A non-professional studying the present report might be more inclined to see the opposite side of the coin, and ask why the activity was not even more widespread: schools are, after all, supposed to be fostering parent-teacher collaboration, so if a high level of interest already exists amongst parents as far as reading is concerned, it would seem only sensible for teachers to take advantage of it. Yet in the Dagenham samples, there were parents who helped their children without any encouragement or advice from the schools whatsoever, and others who claimed that they would willingly have listened to their children read if the schools had indicated that such help would be welcome.

A critic might argue at this point that the Dagenham studies were small in scale, and hence that too much reliance should not be placed on their findings. Perhaps also Dagenham parents are atypical in some way. Other evidence does exist, however, for a pool of interest in school work amongst working class parents. In the Plowden survey of parental attitudes, parents were asked if they approved of their children being given school work to do at home: in the skilled and semi-skilled working class families, 60% of parents said that they approved of this practice, while in the unskilled group, 54% did so. (The figure for Social Class I was only 63%.) Only a minority of children in the

working class groups were actually given homework, however, as the figures in Table 101 reveal.

Table 101

Homework by Social Class: Plowden data

Social Class	I	II	III nm	III m	IV	V	Unclass.	Total
% Given work to do at home	52	47	47	41	35	39	39	42

(The above % are those for all primary school groups combined - top and bottom juniors and top infants. The 'Total' figures for bottom juniors and top infants were only 39% and 26% respectively.)

These figures clearly support the Dagenham finding of a considerable disparity between expressed parental interest and its utilisation by teachers.

In reply to these figures, a critic might argue that parents' professed interest is not to be relied upon. They might want work for their children with no thought of involvement for themselves, or they might not even be serious about wanting work for their children - just cherishing vague hopes about children doing well in school, but with no thought of trying to further that ambition. The Dagenham finding on the percentage of parents helping children with reading suggests that large numbers of parents do take the trouble to try and further their ambitions, and once again, the small print of the Plowden Report yields valuable supportive evidence here. 76% of Class I parents said that their children were given help with school work at home, compared to 57% in Class V, and these figures would have been higher if top infants alone had been considered. (73% of all top

infants were helped, compared to only 42% of top juniors.) The Plowden survey also found that, "Almost a third of the parents had asked for their children to be given some school work to do at home or had asked the teachers to show them how they could help their children at home. The proportions asking increased slightly with social class."

Parents' attitudes to children doing school work at home were also investigated in a study, modelled on the Plowden survey, which was carried out by Wilson in Northern Ireland (Wilson 71.) A socially mixed sample of 421 parents were asked if they thought 'Children at primary school should be given homework.' 128 (30%) said they strongly agreed with this statement, 267 (63%) said they agreed, no parent was undecided, 17 (4%) disagreed, and 9 (2%) strongly disagreed. In response to the statement, 'Parents ought to help at home with the school work given to their children,' 115 parents (27%) strongly agreed, 292 (69%) agreed, 1 was undecided, 10 (2%) disagreed and 3 strongly disagreed. In Wilson's survey, an unfortunate distinction was made between parental attitudes, such as the two described, and parental behaviours. Parents were asked their views on helping with homework, but not if they did help with homework, or even if their child was given homework. Under the 'behaviour' heading, they were asked if they read themselves, and if they spent time with their child in the evenings, but not if they spent time reading with their child. Nonetheless, the pattern of 'attitudes' expressed is so striking as to make it highly probable that large numbers of parents would indeed be willing to help their children with school work at home - and probable also that a lot of parents were

helping already.

Other indications that parents involve themselves on a large scale in children's school work come from the work of Mays (1962) and Goodacre (1968a.) Mays, in a study of the 'urban child,' found that about 60% of the primary school children in his sample who were doing homework were doing so at the request of their parents. (A finding which did not deter Mays from concluding that "it seems true to say that while the average parent (in his sample) was not hostile, he was certainly indifferent to what the school was attempting to do.") The primary teachers interviewed in the Goodacre study thought that more than half of their children were being helped with school work by their parents at home, yet they were also undeterred from concluding that lack of parental interest was a major educational problem.

(In none of the above studies was the association between parental help and school attainment investigated directly. Plowden used pooled home environment indices, Wilson asked about attitudes not behaviour, Goodacre did not analyse her attainment data, and Mays did not collect any, so it is not even possible to re-analyse any of the data using the benefits of hindsight.)

The picture which emerges is one of considerable ignorance about the phenomenon of parents helping their children with school work at home. Prior to the present study, all that seems to have been known with any certainty is that the practice was very widespread. The teachers in Goodacre's study revealed that they knew this to be the case, and harder evidence was also available to the research community from the Plowden Report. What is not known about the phenomenon makes a much longer list. More data is required on the numbers of parents who help of their own accord, and

of those who express a willingness to help if they were asked to do so. Are any parents being actively discouraged from helping by teachers? Is it true, as the Plowden data suggests, that there are more parents willing to help than teachers willing to let them? Those parents who say they would help but do not - is it motivation that they lack, or information and guidance?

More needs to be known about parental help with school work as a component of a child's overall 'home environment,' and, in particular, its relationship to social class membership. In addition, the association between parental help and attainment needs to be explored in much more detail.

Research is needed to answer the above questions, but in the meantime, certain pieces of 'circumstantial evidence' are worth noting.

On the subject of parents who say they would help but do not, the sparseness of the existing literature on home-school collaboration suggests that the motivation of those parents has never been fairly put to the test. There is, however, ample evidence that parents often lack even the most basic information about what is happening to their child in school, (Jackson & Marsden 62, Jackson 64, Young & McGeeney 68, McGeeney 69) suggesting that a failure of communication, rather than motivation, may indeed be taking place. As Young and McGeeney put it, parents' "characteristic state... is that of both wanting information and of not being able to get it." A P.E.P. survey of parents' views on education (Political and Economic Planning 61,) and the Plowden survey both found that many parents - about 50% in the Plowden sample - would like to be told more about their children's

educational progress. The writers of the Plowden Report even thought it appropriate to comment that, although evidence of parental dissatisfaction was not otherwise abundant, this finding should be treated with caution because "a low level of dissatisfaction with school arrangements might only have been evidence of low expectations." This opinion was shared by Young and McGeeney, and it was certainly the impression gained in the present study.

As in the present study, some of McGeeney's mothers helped their children at home without any encouragement or advice from the school. They did, however, feel that lack keenly, and were also aware of potential problems caused by differences in approach between themselves and the teachers in school. The needless dilemma of parents in such circumstances is well illustrated by one Dagenham mother, clearly recalled, who had noticed the conflict between her method and that of her child's teacher, but who could not understand the purpose behind the teacher's 'new-fangled' ways: the teacher was in fact using, not i.t.a. or anything like it, but standard phonic methods of teaching reading. The mother was only familiar with alphabetic methods, and no-one had apparently troubled to explain to her the advantages of the phonic method.

(An interesting aside here is that the original planners of the i.t.a. experiment wanted to involve parents, and prepared pamphlets for their guidance. Parents finding it difficult to absorb information in this way seem not to have been catered for so well, and if the above is any guide, class teachers are unlikely to have taken it upon themselves to act as information sources. What effect the resulting confusion might have had on the outcome of the experiment remains a matter for conjecture.)

Parents as a resource

In her foreword to Young and McGeeney's 'Learning Begins at Home,' Lady Plowden wrote, "What comes out strongly in this book is the passionate but impotent interest of so many of these parents. They wanted their child to do well, they wanted to help, but they felt ignorant and did not know how to do so." Parents, Lady Plowden continued, were an "untapped source of strength to the school."

In the present study, it was found that parental help is associated with improved reading performance: if it can be demonstrated, by experiment, that a causal connection underlies this association, then Lady Plowden's words acquire new and concrete meaning, and the possibility arises that schools, by failing to make use of parents as a resource, are doing a disservice to pupils and parents alike.

The above discussion throws up a number of very awkward questions. Firstly, why are parents not treated as a resource by schools, as far as helping with children's learning is concerned? Secondly, why is so little known about the value of an active parental contribution to children's learning - why has so little research been done on the subject? And thirdly, why do 'experts' on the subject of parental involvement conspicuously fail to mention involvement in school work as opposed to the utilisation of parents as unpaid welfare assistants on school journeys and similar occasions?

These questions can probably be answered very simply: parents are not used, or studied, as an educational resource, because nobody in the educational establishment seems to have thought of them that way.

The following sections of this chapter are devoted to adducing evidence in support of this claim, and to a discussion of why the idea of parents as a resource has received so little serious attention in the past.

Parental help as an aid to performance

For reasons which will be discussed shortly, the educational establishment seems never to have given much thought to the possibility that parental help with school work might have a genuinely beneficial effect on performance. In a vast literature, it is significant that only a very small number of authors have even bothered to comment on the idea. Dissatisfaction with the traditional view of the passive parent has been expressed by a few authors (Clark 73 and 75a, Durkin 66 and 72, Mead 61, Palmer 72) with Clark in particular voicing her suspicion that the contribution of parents to their children's progress is being habitually under-estimated by teachers. (That suspicion is certainly borne out by the findings of the present study.)

In 'Where', the 'education magazine for parents,' between 1960 and 1976, five articles appeared telling parents that they should help with reading if they wanted to, (Diack 68, Cashdan 68, McAlhone 72, Stott 74 and Bilski 76), one article told them that they should not (Goddard 62) and another told them to "leave the formal skills alone," but that listening to reading was probably alright. (Hall & Parris 66.) In the same publication, Jarman (1971) and Mullarney (1973) submitted case-study or anecdotal evidence supporting the view that parental help with reading can have a beneficial effect on performance, and similar evidence has

also appeared elsewhere. (Durkin 66, Hansen 69 & 73, Hoskisson et al 74, McGeeney 69.) What is conspicuously lacking, however, is sound experimental data on the subject. As McGeeney put it in 1969, "We have no firm evidence in this country to show that auxiliary help does affect children's performance either way."

The present study was a survey, not an experiment, and as such, could only provide evidence on the associations between variables. Nonetheless, it is possible that one of the study's chief contributions has been the demonstration that auxiliary help from parents is associated with improved, not impaired, performance.

(As has already been pointed out, a number of studies have come close to providing data which could have been used for this purpose (C.A.C.E. 67, Wilson 71, Goodacre 68a, Morris 66: also Cane & Smithers 71) but none of them looked specifically into the parental help/performance connection, a fact which is significant in itself.)

Parental help as a hindrance to performance

To the general reader, the idea that parental help with reading improves children's performance might sound like a statement of the obvious. Leaving aside the specific content of the debate makes it sound more obvious still: a young person in the early stages of acquiring a skill is given practice sessions with a helper; the helper is not an 'expert,' but has mastered the level of performance which the learner is presently tackling. As 'common sense' - and psychological learning theory - would predict, the extra motivation and practice have the effect of improving the learner's level of performance.

In the absence of hard evidence that parental help improves performance, the above argument suggests that it is in any case a strong possibility. The non-professional might, therefore, be surprised to learn that, far from seeing the above argument as a statement of the obvious, many teachers would regard it as educational heresy, threatening their status as professionals. In the specific terms of the present controversy, it seems to be assumed by some teachers that reading to parents at home has, at best, no effect on performance, and at worst, an adverse influence. McGeeney, in the quotation above, was recognising these beliefs when he said that there was no evidence 'either way.' Lady Plowden's previously mentioned foreword to 'Learning Begins at Home' expressed concern that some teachers might still hold such views; the little evidence there is suggests that this concern was altogether justified.

Goodacre's findings are revealing here. When primary school teachers were asked to rate the importance of various home background factors from an educational point of view, last out of a list of 34 items was placed 'parents help with school work,' far behind such features as 'good, sensible food,' 'good sensible clothing' and 'travel and holidays.' (Goodacre 68a).

Goodacre also asked the teachers how they liked parents to show their interest, particularly with reference to the teaching of reading. As usual, visiting the school and providing the child with encouragement figured highly. Hearing children read aloud was mentioned infrequently, and then more often by heads than by class teachers. In her 1970 (a) review publication, Goodacre reported this last mentioned

finding, then added her own opinion about parental help with reading; "To the teacher actually engaged in teaching the child to read this practice might prove more of a hindrance than a help." Since empirical evidence to substantiate this claim was not available, either in Goodacre's own research or in that of others, including such a remark in a review of research findings might be considered rather misleading.

No explanation was advanced by Goodacre as to why active parental involvement might prove a hindrance to children's learning. Palmer (1972) provided a clue when he described the 'unique mystique' which he found teachers attached to reading: parents were discouraged from helping on the grounds that the task necessitated the services of an expert.

Unsystematic information was collected from school heads and class teachers in the present study, and attitudes resembling those that Palmer had noted emerged very clearly: in short, confusion was thought to be the likely result if untrained people tried to help with reading. A slight beneficial effect of practice might be conceded, but the confusion engendered by non-professional help was considered to be so great that the overall effect would in all probability be detrimental.

The only explicit references to this idea in the literature are similar expressions of personal opinion. (Schonell & Goodacre 74, Goddard 67, Hall and Parris 66.) The following quotation from Hall and Parris illustrates very well the attitudes referred to: ..."teachers, in spite of their over-large classes, are curiously reluctant to

enlist the help of parents. This is probably largely because uninstructed parents can and do muddle children (who then have to be laboriously unmuddled by a busy teacher)..." This view was expressed in the authors' article in 'Where', referred to earlier, an article which was clearly intended to be used by parents as a source of sound expert advice. (The article was entitled, 'How to help your child at home.')

It is necessary to state quite clearly at this point that the above ideas have never been subjected to empirical test. In these circumstances, the findings of the present study are very significant, because they suggest that, as a description of events, the above ideas are incorrect: children helped with reading by their parents may experience confusion resulting from a clash of methods, but the activity's beneficial effects outweigh its disadvantages, and the end-product is an improvement in performance.

Differing views of the parental role

Insufficient attention, it is suggested, has been paid by teachers and educational researchers alike to the potential value of parental help as an aid to children's learning. The question arises as to why this should be so.

In the introduction to this report, the E.P.A. attempts at home-school collaboration were criticised at some length, and the conclusion was drawn that very little progress had been made in this direction. In the view of Young and McGeeney, "..... the lack of co-operation between school and home... accounts for the most serious weakness there is in British education."

As Goodacre's research demonstrated, teachers do not doubt the influence which a child's home background and the behaviour of his parents can have on his progress in school. It must be asked, therefore, how teachers reconcile this acceptance of the significance of parents with their own defence of the 'status quo' as far as home-school collaboration is concerned.

An important factor here seems to be the widespread acceptance by teachers of 'supportive home' theories of the influence of a child's home background, with their implied passive role for parents. (On this model, a 'good home' is seen as one which makes the child more ready to learn from his teacher, rather than one in which the child is also learning from his parents.) If the most which can be expected from parents is passive support for the school's activities, then this frees teachers to regard home-school liaison as something of a luxury, to be fostered only when time and more pressing commitments permit. Since time and more pressing commitments rarely do permit, the end-product is that lip-service is paid to the desirability of liaison, then everybody goes on as before.

It must be added that holding an essentially passive view of the role of parents has another, very convenient, consequence for teachers: active parents threaten teachers' professional status; passive ones much less so. Other authore with a more specific interest (Musgrave 72, Tropp 57, Blyth 67) have discussed at some length teachers' desire for increased professional status, and the point will not be considered in any further detail here.

The effect of these two forces has been to shape the

attitudes of some teachers into a rather curious mixture of condescension and hostility. Parents, it seems, cannot win: either they are educationally insignificant and therefore not worth bothering with, or they are potential threats to the professional status of teachers and hence to be resisted at all costs. (The paradox here does not appear to have been appreciated by the parties involved.) The criticism is a harsh one, but evidence to support it is only too easy to find.

The EPA literature provides some particularly striking evidence here. In the early days, when the Plowden Committee's proposals for involving parents were put to teachers, their attitudes were found to range from the indifferent to the guardedly suspicious, as Halsey's account of the period reveals. (Halsey 72.) The N.U.T. went to one extreme, disregarding the possibility of a worthwhile parental contribution to the extent of commenting that "... there was a limit to the time teachers could spend on community relations." Halsey himself went to the opposite extreme, and took a great deal of trouble to allay teachers' anxieties, as may be seen from the following passage:

> Parents cannot help with the education of their children unless they understand it. The first step is observation, but to go from observation to participation presents problems. It is at this point that teachers may begin to worry that they will be supplanted, or their professional quality diluted, by the active presence of parents... The parent's participation in school work is to acquaint him with the educational process through which the child is being guided by the teachers. And the best way of getting parents to understand it is to let them go through the same process. In fact, the parent's role in the classroom is more like the child's than the teacher's. This is the chief reassurance for the teacher's fears.

Two better examples of how to under-estimate the potential contribution of parents would be hard to imagine.

As the EPA scheme progressed, indifference gave way to open antagonism on the part of some teachers. In the Dundee EPA, for example, active attempts were made to involve parents more closely in the life of the school, with the following response from teachers:

> Parent initiative and responsibility in the life of the school were discouraged. ... Despite (the) mothers showing such an active interest in their children's education, the scheme came to nothing largely because the schools were unwilling to accept that parents should play what to them was an unconventional role. (Watt 74.)

The Dundee teachers did not even have to fight for their victory, because from the very beginning, "Teacher/ parent co-operation was not based on equality, it was based on an authoritarianism which was expected by both teachers and parents."

It is worth noting here that the Dundee project was not an ambitious one, in that it merely aimed to increase parental involvement in accordance with the supportive home tradition. Involvement in school work was never even suggested. As the quotations above make plain, however, even this form of collaboration with parents was strongly resisted by the teachers concerned.

Although the EPA project directors were not imprudent enough to encourage parents of school-age children to involve themselves in school work, they did risk doing so with the parents of preschool children. EPA under-fives, it was argued, were in need of special preschool experiences to repair their 'deficiencies,' such as not knowing their colours or not being able to count to five. The suggestion

that the children's own parents should be encouraged to provide these experiences was discussed in the following way: "If there is forbearance from the professional teachers and charity from their trade unions, then parents can learn to teach and the primary schools can begin their own task without a crippling handicap of ineducability amongst their five year olds." (Halsey 72.) So great seems to have been the strength of feeling aroused, that one important point was overlooked: middle class children, the reference point for the whole EPA experiment, enter primary school knowing their colours and being able to count because they have been shown - taught - how to do so by their parents. In other words, if middle class parents teach their children how to count, then that is altogether to be applauded; if working class parents teach their children how to count, after having been encouraged to do so, then that requires 'forbearance' from teachers and 'charity' from their trade unions.

The EPA experiences are not atypical: it might in fact fairly be said that the biggest obstacle encountered by all action research projects in this field has been, not the apathy of parents, but rather the antagonism of teachers. (Green 68, Young and McGeeney 68, Watt 74, Halsey 72, Lyons 73, Chorlton 67.)

Other references to teachers' authoritarianism, patronisation, 'missionary' attitudes and sheer hostility towards parents are also to be found in Goodacre (1970a), Cane & Smithers (1971), Mays (1962), McGeeney (1969), Palmer (1972), Jackson (1964) and Musgrove & Taylor (1965).

A defensive circle

The teachers involved in the EPA projects described above clearly found that the experiments made unacceptable demands upon them in terms of the changes required in their relationships with parents. Their reasons were probably mixed - an awareness of threatened status, a feeling of being socially ill-at-ease in the presence of working class parents, a general 'community relations' attitude to parent involvement, all leading to a lack of commitment and conviction that the new ideas were worth being given a try. It should be recalled too, that in the EPA experiments, the types of home-school liaison which the projects sought to foster were completely in accord with 'supportive home' theories of a passive parental role. It seems quite likely, therefore, that projects in which parents were given an active role - hearing their children read for example, would be perceived as even more threatening to teachers' professional status, and hence even less acceptable, than the EPA proposals had been.

From a research point of view, the real problem here lies in the potential circularity of the arguments. If teachers are to be presented with evidence that new ideas are effective, then those ideas need to be given a try: but unless a few teachers can be persuaded to risk the unfamiliar, then the needed evidence cannot be obtained; and other teachers will not change their practice unless there is evidence that to do so would be worthwhile...

If the EPA attempts at parental involvement are any guide, breaking into this circle of argument is a very difficult task indeed.

The defensiveness of teachers' position is demonstrated with even greater clarity by the prevalence of the attitude that only officially approved new ideas should ever reach the classrooms anyway - and since teachers are the experts, they are the obvious people to decide which ideas are to be tested. When action research was first being planned in the EPA's for example, the N.U.T.

> .....insisted that no activities be proposed without full consultation with the profession, and there was a general feeling among the teachers that the profession itself was in the best position to judge what particular kinds of programme were most useful and appropriate in their areas. (Halsey 72.)

Needless to say, the profession did not judge that parent involvement programmes were either useful or appropriate. In the London EPA, where the profession's own proposals were implemented, school-based programmes were carried out. The outcome of these programmes has already been referred to in Chapter 1, but is worth repeating here: on evaluation, it was found that "... almost without exception, the measured effects on the school performance of the subject children was disappointing." (Barnes 75.)

The evidence is compelling that teachers do not always know best. If the dictum that they do so is not abandoned, then a number of questions of vital concern to parents will never be asked: the theory that non-professional help confuses children will never be put to the test, parents who want homework for their children will still be refused it (Goodacre 70a, C.A.C.E.67,) and the solution to the concerned but uninformed parent will still be discouragement rather than enlightenment. A change in research emphasis is also long overdue. The question traditionally asked in working class areas is, 'How can we raise parents' interest

in education?' - whereas a more realistic statement of the problem would seem to be, 'How can we persuade teachers to accept the involvement of parents in their children's education?'

The practicalities of home-school liaison

It must be said in teachers' defence that very little research has actually been done on the practicalities of fostering collaboration between home and school. In the opinion of some authors, research of this kind has become conspicuous by its absence. (Sharrock 70b,Husen 72.) Furthermore, if educational researchers have given teachers little guidance on how best to conduct their relationships with parents, educational policy makers have done them no better service; advice and guidance on this subject from 'expert' sources is best described as highly unimaginative, frustratingly vague, or both. As far as can be ascertained from a reading of published documents, the educational establishment is united in tacitly accepting a 'supportive home' model of parental participation; specifically, none of the various home-school liaison methods referred to - parent clubs, educational home visitors, teacher-social workers, and so on - have any direct reference to school work at all. (See, for example, central government publications such as C.A.C.E. 67, D.E.S. 68, 70 and 75; NFER publications such as Goodacre 70a; a Home & School Council Report, also by Goodacre (1968b); the various EPA reports, especially Halsey 72, Midwinter 72 and Morrison 74; LEA sources such as Pumfrey 69.)

(In these circumstances, little disquiet need be

aroused by the study quoted in both the Plowden Report (C.A.C.E.67) and Morrison & McIntyre (1969), which compared the attainments of pupils in schools selected by inspectors as having good parent-teacher relationships with those of pupils in a 'representative sample of schools,' and found no significant difference between the two. If the above literature is any guide, 'good' relationships to the inspectors probably meant schools allowing parents to run jumble sales and make costumes for the school play, rather than allowing them to involve themselves in school work at all - the former, incidentally, being devices useful for channelling parents' energies away from more threatening types of 'home-school collaboration.')

The validity of the 'supportive home' theory is not the only untested assumption made by the 'expert' sources listed above. Almost equally widely held is the belief that the only really worthwhile type of home-school liaison is the sort in which parents come to the school, whether it be to PTA's, Open Evenings, or possibly even into classrooms during the school day. Understandable though this may be in the light of what has already been said about teachers, and their desire to be in control of the activities of non-professionals, bringing parent and teacher face-to-face on what is manifestly the teacher's territory seems to be - in very many cases - a solution which satisfies nobody. Such arrangements stress the inequality in the parent-teacher relationship and as such, serve to 'type-cast' the various participants in their conventionally recognised roles. What often seems to happen is that neither side sees the point of continuing such an unequal partnership, 'collaboration' founders, and the teachers say, 'We have done our best, but the parents did not respond.'

Going back, as it were, to first principles, increasing

collaboration between home and school is, according to the 'supportive home' theory, supposed to benefit children by improving their parents' attitude to education, by reducing divided loyalties, and by making the children recognise that their parents regard schooling as important. Even if this interpretation of successful home-school liaison is accepted, it does not necessarily follow that the best way to achieve these aims is to increase the amount of time parents spend in school or in the company of teachers. In fact, if the expressed aims could be achieved without so doing, much stress might be saved for all concerned.

It is possible that giving children school work to do at home and enlisting parental assistance with it would help to achieve the above aims, providing of course that the level of work was within the parent's capabilities, and that both parent and teacher fully recognised the value of the contribution the parent was making. The teacher would maintain overall control of events, because it would be she who specified the work to be done, just as she would do if parents were being employed as classroom aides.

As a means of improving relationships between home and school, this arrangement would have the added advantage of being based on a specific, definable task; parents and teachers could see immediately the parts they were being called upon to play, and the aims of the exercise would be clear from the beginning.

Such a scheme compares very favourably with the type of 'collaboration' which Young & McGeeney were trying to foster in their action research project (Young & McGeeney 68): nobody, parent, teacher or researcher seems to have had a

clear idea of what the participants should actually be asked to do. Middle class teachers and working class parents were effectively thrown together in the hope that a 'modus operandi' would somehow emerge: not surprisingly, none did.

Coming back to the earlier point about the desirability of parents going into schools, it is suggested here that concentrating on what parents do at home with their own children, as opposed to what the teacher permits them to do in the classroom with somebody else's children, may well prove to be the more profitable line of enquiry. It is not unusual to hear a teacher say, 'of course, the trouble with parents in the classroom is that they are only interested in their own children:' it is meant as a criticism, and perhaps in the context of the classroom the teacher is right. In the context of the home, however, parents' interest in their own children is a strength which schools should capitalize upon, not an antisocial trait to be deplored.

The above idea needs to be tried out in practice. In order to do this properly, some way must be found of breaking through the defensive circle of teachers' arguments and gaining their co-operation, because unless this is achieved, any experimental programme is virtually doomed to failure before it has even begun.

It is suggested here that the best line of approach in these circumstances is to emphasise the benefit which the children stand to derive from the proposed changes. This has not always been the approach adopted in the past: Young & McGeeney, for example, gave prominence to the issue of parents' rights. To them, the essential first step on the way to real collaboration between home and school was the

recognition by teachers that parents have a right to be informed and consulted about their children's education. Jackson and Marsden (1962) put the same case, calling for 'an utterly different recognition of the parents' place and the parents' rights.'

The evidence reviewed earlier on teachers' continuing antagonism towards parents shows how little progress has been made in this direction, and certainly, Young & McGeeney did not get very far on 'the way to real collaboration.'

The following quotation from Goodacre (1970a) suggests a possible reason why: "... the principles which govern effective parent-teacher relationships are the same as those which govern all effective human relationships - mutual respect, liking and goodwill." Goodacre was speaking prescriptively: the 'real life' teachers from working class schools, whose attitudes towards parents were described earlier, showed few indications of 'liking and goodwill' and none at all of respect. Not surprisingly, they also disregarded simplistic appeals to do otherwise.

The influence of "supportive home" theories on parent-teacher relationships

Attention has already been paid to some of the effects of 'supportive home' theories on teachers' attitudes to parents. It is now suggested that in working class areas, acceptance of these theories has another unwelcome consequence - it reduces the possibility of 'mutual respect.'

When 'supportive home' theories are applied to most working class homes, they inevitably draw attention to many things the parents do not do; they do not own a lot of books,

they do not read quality newspapers, they do not discuss their child with school staff, they do not have educationally favourable language behaviour. The tendency, therefore, is to regard parents as negative influences on their children - as adversaries rather than partners in the educational enterprise. Consequently, parents are not treated with respect, and attempts at home-school liaison are either endured, or better still, avoided.

In the opinion of the present writer, it is quite unreasonable to encourage teachers to believe in 'supportive homes' as currently defined, and yet at the same time to welcome, as their partners and allies, parents who provide homes which are, by these criteria, manifestly unsupportive. A better stratagem, it is suggested, would be to stress to teachers what parents can do for their children - how they can motivate them, how they can help them. The present study provides evidence that parents can indeed make useful contributions of this nature, and suggests that changes of practice in this direction would be rewarded.

Parents as partners in the educational process

A moment's thought reveals that the present study findings have deeper implications than the above pragmatic arguments would indicate. Not only do they raise the possibility that parents and teachers can become partners in the educational process, but they suggest that they are partners in the present, and have been so in the past, far more often than teachers have ever given them credit for. Putting it more strongly, the possibility is raised that some of the credit which teachers take for children's school

successes should, already, more fairly be given to parents. Clark (1973) has expressed similar views.

A very radical change of attitudes is likely to be required before teachers will be able to accept such ideas: firstly, that whatever rules they make to the contrary, some parents will actively involve themselves in their children's efforts to learn; and secondly, that these 'interfering' parents are actually owed a debt of gratitude for the beneficial effect they have had on their children's performance.

Social class and parental involvement in school work

It was suggested earlier that, by discouraging parents from involving themselves in their children's reading, teachers were failing to make use of a very valuable educational resource. Using evidence from the Plowden Report, it was argued that this wastage of resources was taking place on a large scale, with most parents helping their children on their own initiative, rather than at the instigation of the school.

Of the various social class differences reported in the Plowden findings, the following deserve renewed attention in the present context; unexpectedly, "...there was little social class difference in the proportions of parents wanting their children to be given some homework," but despite this, "...the children of manual workers were slightly less likely than other children to be given school work to do at home." (Plowden II, Para 2.31: C.A.C.E.67.) It seems, therefore, that although teachers' discouragement of parental 'interference' in children's school work is not confined to

working class families, it is perhaps more common there.

Two other factors may be operating here to the disadvantage of working class children: firstly, it is not unreasonable to suppose that their parents are more likely than middle class parents to follow teachers' orders in this matter; while on the other hand, working class parents who persevere with helping their children without support from the school are perhaps more likely to run into difficulties than their middle class counterparts. As McGeeney (1969) and other authors (Jackson 64, Green 68, C.A.C.E.67) have pointed out, parents are more likely to have an adverse effect on their children's education if they are denied information and guidance by the school: this warning may be particularly applicable in working class areas.

There is no evidence that active parental involvement in school work has a detrimental effect on children's attainments; the results of the present study suggest the opposite. Similarly, there is no evidence that giving homework to primary school children does them any harm, whereas there is a suggestion that in attainment terms, it is beneficial. (Wilson 71, Wiseman 67.) In these circumstances, teachers who discourage parents from helping their children may well be perpetuating a form of 'educational disadvantage' far more subtle than that described by Bernstein (1970) in his paper, 'A critique of the concept of compensatory education.' Bernstein's point was that, until disadvantaged chldren could attend schools which were as good in every way as those attended by middle class children, talk of 'positive discrimination' was simply

inapplicable. Similarly, if more opportunities were to be made available for working class parents to help their children, this might be more a matter of equalising educational opportunity than exercising positive discrimination.

A possible intervention programme

The design of a possible intervention programme has already been hinted at in the above discussion: give working class parents every encouragement and opportunity to help their children with reading at home, and see if this has any effect on the children's reading attainment.

An investigation along these lines would have a number of advantages over comparable studies carried out in the past. The first point in its favour is that it would be using a predictor from the original research as the target behaviour for intervention. In the past, predictors of reading attainment such as 'good auditory discrimination' have been used in this way, i.e., attempts have been made to train the skill in question and measure the effect on reading performance. Home background predictors, however, have never been satisfactorily followed through in a similar manner. The reasons for this are not hard to find.

For a long time, the only home background indices to be studied were 'frame' variables such as social class. These variables were recognised as representing an 'unanalysed complex of causes' quite unsuitable for experimental manipulation. A call for research to identify 'process' variables, which could be used in intervention programmes, has been explicitly made by some authors (Floud et al 56, Young 67, Sharrock 68 and 70b,Miller 71, Husen 72) but apparently with

little result.

As was described in the Introduction to this report, process variables accounting for a large proportion of attainment variance have appeared in the literature: on closer inspection, however, they are found to be unhelpful as guides to action, because they are composite indices, formed by the statistical combination of a number of different variables. (Dave 63, Wolf 64, Weiss 69, Marjoribanks 71, 72a and b, 73 and 74, Walberg & Marjoribanks 73.)

One example of a more tangible home background predictor of school achievement is maternal language behaviour. Valuable as this variable has been as an aid to understanding the influence of the home, it suffers from one serious drawback as far as intervention programmes are concerned: the aspect of the home deemed most relevant for school success is considered to be an extremely difficult one to change. According to Bernstein, parental modes of thought, language behaviour - and attitudes to education - are all fixed functions of the class structure of society, and as such are essentially unmodifiable.

The Plowden and Bullock Reports, many of the EPA programmes, and the new 'language experience' approach to the teaching of reading have all been heavily influenced by Bernstein's theories. In almost every case, the model of intervention employed has been, not an attack on the cause of 'language deprivation,' because that is considered to be beyond hope of change, but rather an attempt to ameliorate the symptoms of the condition by applying the services of an outside agency.

The agency is the school, and the task is to provide children with the right sort of 'language experience' - or

whatever - as opposed to the wrong sort provided by their parents. The result is that the latter's contribution to the education of their children is even more firmly denied than it was before Bernstein's theories ever made their mark. The point which is being argued here is not that the theories are necessarily incorrect; rather that their application to intervention programmes of the type outlined above may be misguided, because of the damage done to home-school relations when the role of parents is denigrated in the eyes of teachers. (That this was never intended is irrelevant to the problem.)

As was pointed out by Barnes (1975) and mentioned earlier, most of the EPA programmes, including the National Preschool Experiment, fell into the trap of trying to find educational remedies for problems of non-educational origin. In Barnes' view, the lack of success of these programmes should be considered in this light. In the opinion of the present author, not only were these programmes ill-advised in Barnes' terms, i.e., they were inappropriate to the problem and hence ineffective, they may even have been actively counter-productive.

Earlier, it was suggested that Bernstein's ideas fitted well into currently popular 'supportive home' theories of the influence of a child's home environment. Other characteristics of a supportive home were also mentioned, the most prominent being favourable parental attitudes and interest in education, as manifest by regular contact between parent and teacher, and parental involvement in the less strictly educational aspects of school life. Statistically speaking, these last mentioned variables are all significant predictors

of school achievement. The very small number of intervention programmes which have been carried out in this country using an established home environment predictor as their target behaviour have all subscribed to this version of the supportive home model. (Green 68, Young & McGeeney 68, Midwinter 72, Morrison 74, Smith 75; see also ILEA 73 & 74.) Hence the aims in each case were to increase parental interest in education, and to improve parental attitudes, by means of increasing the amount of contact between home and school.

In Chapter One, it was argued in some detail that interventions of this type were based on an inadequate analysis of the underlying problem. For the present purposes, however, it is sufficient to note that, because the predictor was a crude measure - parental attitudes to education - it could not be translated directly into a plan of action: in other words, having agreed that the aim was to foster good attitudes, the project directors were still left with the problem of how they were to do it. The action research teams were not entirely to blame for the confusion and muddle which followed: for example, one of the cornerstones of the supportive home theory was the Plowden Report, yet it was found to be impossible to identify individual target behaviours from that source, because all the home environment data had been related to achievement by analyses along statistical composite lines. The results obtained from these analyses lent themselves to the formulation of conclusions - and recommendations - in only the most general terms.

It is suggested here that an intervention programme which aimed to increase the number of working class parents listen-

ing to their children read would be free of most of the above criticisms; its target behaviour would be an established predictor in its own right, with the added advantage of being easily definable in concrete behavioural terms; it would also be a way of capitalising on the influence parents have on their children, rather than seeking to neutralise that influence or supplant it with something thought to be more suitable.

There would also be other advantages. For example, the activity asked of parents would not be a completely unfamiliar one to most of them. If the results of the present study are correct, even in a working class area, a great many parents would help with reading at some stage anyway, and an appreciable number would even continue to do so without external support. A useful comparison may be made at this point with certain American Compensatory Education programmes (e.g., Gordon 70, Karnes et al 70) in which mothers were encouraged to teach their children cognitive skills, such as matching shapes and colours, and language skills. Consciously training their children in this way must have been a very alien activity to most of these mothers, a factor which presumably influenced the level of co-operation achieved in the projects. In these projects, the 'required' behaviour was imposed on parents from sources quite outside their own experience: helping with reading, on the other hand, would be more a matter of modelling the behaviour of as many parents as possible on that of the most 'successful' parents within their own community.

(It is worth noting at this point that attempts to increase working class parents' interest in education by calling parents' meetings and establishing formal parent-

teacher organisations also fall into the trap of seeking to foster activities which are alien to the population concerned. No attempts are made to find activities which would better fit the existing pattern of social interactions within a working class community - as described by Klein (1965), and Young & Willmott (1957,) for example. Instead, an entirely middle class model is adopted, and efforts are made to graft odd bits of middle class behaviour onto the existing working class pattern.)

Another advantage, connected with the one above, is that hearing children read has high 'face validity' as a means of improving their progress in school. In other words, to the mothers concerned, the link between their own activities and their child's success in school would be more apparent in these circumstances than if they were teaching cognitive skills on the lines described above. Since mothers who see the relevance of what they are doing are more likely to continue doing it without external support, high face validity is clearly an asset in any intervention programme. It is also possible that helping with reading gives mothers more immediate, and recognisable feedback than does teaching more general cognitive skills.

Listed above are reasons why it might be possible to persuade parents to listen to their children read: it remains to be asked whether persuasion as such is likely to be necessary. The majority of working class parents - and their children too - need no convincing of the importance of literacy (Schools Council 68,) while the evidence reviewed earlier suggests that they themselves would like to be of help, but are unconvinced of the value of their contribution. In these circumstances, 'intervention' might well prove to be no more than giving official sanction and approval to the

active expression of existing interest and ambition as far as many working class families were concerned. (Genuinely uninterested parents will, of course, continue to exist and it must be freely admitted that none of the above proposals would yield any benefits at all for their children. Perhaps in such cases, school-based programmes hold out the only hope of effecting an improvement in the children's attainments.)

The advantages and disadvantages of various sorts of educational intervention programme have been debated at some length. Before closing the subject entirely, however, brief attention will be paid to the work of Francis (1974b). Questioning the assumption that it is the poor language ability of disadvantaged children which sets the limit to their ability to learn to read, Francis examined the speech structuring skill of both socially advantaged and disadvantaged children. She found that, contrary to popular belief, the language of both groups was quite adequate to sustain the early stages of learning to read: in other words, insufficiently developed language could not itself be the factor which was limiting reading progress in the disadvantaged group.

Francis's findings are important because they seriously question the wisdom of <u>any</u> attempt to raise reading standards by fostering improved language behaviour, however desirable the latter aim might be as an end in itself. (And it might be added that for many teachers, it seems indeed to have become an end in itself, perhaps even to the neglect of the original aim.)

The conclusion which can be drawn from Francis's work is that, relying only on working class children's existing language behaviour, improvements can be made in their reading

attainments.

If the findings of the present study are correct, it may be possible to effect such improvements using parents as the agents of change: it may even be found that mothers who have little in their favour on Bernstein's language criteria can nonetheless exercise a favourable influence on their children's reading performance by regularly listening to the children read at home. Such a possibility clearly raises very important practical and theoretical questions about the nature of educational disadvantage, and the immutability of the handicap imposed by certain types of home background on children's progress at school.

There is as yet no evidence to support the above arguments. In these circumstances, further discussion can only be at the level of conjecture, and the following paragraphs should be read with this in mind.

Long-term benefits of raising reading attainment

If an improvement in the reading skill of working class children can be effected in the early stages of their school career, the question then arises, are there any long-term benefits? More specifically, if children from otherwise adverse home environments succeed in learning to read, do their subsequent school careers resemble those of children from more favourable backgrounds, or do they revert to the pattern characteristic of the disadvantaged? In the normal course of events, early reading achievement predicts subsequent school success very well indeed (Morris 66, Cockburn 73, Crawford 68, Ross & Simpson 71) and a number of authors have expressed the opinion that reading ability remains the key to school progress even in the secondary school period.

(Jenson 67, Barnes 75.) There is also a suggestion that a complex 'feedback' relationship exists between a child's attainments, and his attitudes to school and school work in general (Barker-Lunn 69 and 71.) In the last-mentioned research, a positive correlation was also obtained between teachers' liking for particular children and those children's attainments. Further, there is some suggestion that teachers' perceptions and expectations of children are directly influenced by their reading ability. Ablewhite (1967) reported that the children in his school who were 'low IQ but readers' were treated in the same way as other children by teachers and pupils alike, whereas the low IQ, non-reading children were 'social misfits.' Cane and Smithers (1971) found that children who were good readers were seen by their teachers as more intelligent than their tested IQ scores indicated.

All the above raises the possibility that if attainments can be improved, by some means or other, in the primary school years, then this might remove at least a few of the obstacles to long-term school success which confront working class children. On the other hand, it must be recognised that home backgrounds which were educationally unfavourable for a seven year old are likely to pose a whole new set of problems for a child of fourteen, and it is unrealistic to expect that an 'antidote' to the earlier difficulties will necessarily be any protection at all against the later ones.

Research is clearly required into the long-term effects of early reading success achieved by the 'artificial' means of specially designed intervention programmes. It is the present writer's firm belief, however, that even if all the beneficial effects of such programmes were to 'wash out' by

the time children reached secondary school age, then the interventions would still have been worthwhile. Giving the opportunity of success, however limited, to children who would otherwise have experienced nothing but failure, should not be discounted on the grounds that sooner or later failure is inevitable.

Before leaving this subject, brief attention will be paid, by way of counter-balance, to a much more optimistic long-term view. Carol Chomsky studied the relationship between children's exposure to written language and the rate of their linguistic development in the period 6-10 years of age, and concluded that "... exposure to the more complex language available from reading does seem to go hand-in-hand with increased knowledge of the language." (Chomsky 72.) In other words, children who read widely and well are at an educational advantage in not one, but two respects - directly, through the mechanisms described above, and indirectly, through the influence of reading on language development and hence, if Bernstein is correct, on modes of thought and a more general 'educability.'

Reading readiness, IQ and the home environment

Chomsky's work questionned very widely held assumptions about the nature and direction of the link between reading and linguistic development, and as such, has wider implications than might at first be appreciated. What of the other skills, for example, which have been assumed to be antecedents of reading progress? The literature on 'reading readiness' provides a number of examples - visual and auditory discrimination, matching and generalisation skills,

the understanding of concepts and the significance of symbols, the ability to give attention to a learning situation (Chazan 70.) Perhaps these skills too can be developed by increased exposure to reading materials. Research is needed to find out. If such an enterprise were successful, the consequences would extend far beyond the rather narrow field of reading readiness testing into the much more controversial one of intelligence or 'cognitive' testing, because of the overlap in the skills tapped by the two types of test. As Goodacre (1970b) has pointed out, most reading readiness tests resemble either IQ tests or elementary reading tests, and if the list of readiness skills given above is any guide, children who have acquired proficiency in these directions would be very well-equipped to tackle many of the items in conventional tests of IQ.

A high positive correlation is usually found between scores on reading and intelligence tests, and is traditionally interpreted as demonstrating the relationship between ability and attainment. It is being suggested here, however, that at least part of the observed relationship may be due to the overlap of skills acquired in the course of learning to read with those tapped by cognitive tests. Perhaps less important, but still worth noting, the specific content of certain subtest items on the WISC, for example, must be acquired from somewhere, and books seem as good a place as anywhere to learn the colour of rubies, or who discovered America.

The modifiability of IQ has already been discussed in this report with reference to the possibility that the same environmental factors which can depress school achievement may also depress IQ. It is now being suggested that,

not only have the two types of test probably got common antecedents, but possibly common content - in terms of the skills they tap - as well.

(Interesting experiments could be devised to test these ideas - giving prolonged reading coaching and exposure to a wide range of reading materials, for example, and observing any change in IQ, or training reading readiness skills such as matching and discrimination, and seeking a spillover effect in terms of IQ score obtained.)

The above suggestions concerning the relationship between intelligence and attainment tests have deliberately been presented in an extreme form in order to draw attention to their practical implications. The argument here is essentially the same as that presented in Chapter 3, i.e., that any procedure, no matter how technically sophisticated, which compares children's actual attainments with some expected value derived from a consideration of IQ carries the risk of effectively justifying the status quo as far as some disadvantaged children are concerned.

In a theoretical discussion of the problems of predicting achievement, Thorndike (1963) drew attention to the danger of choosing predictors which overlapped with the criterion measure either in antecedents or content. It is of interest to note that Yule's work, described in detail in a previous chapter, was heavily influenced by Thorndike's advocacy of regression methods for the analysis of achievement data, but seems to have ignored this particular caveat concerning the overlap of predictor and criterion.

As was pointed out in the earlier discussion, Yule's technique for picking out underachievers is consonant with a traditional 'innate potential' interpretation of IQ. He and his colleagues are at pains to point out, however, that

this is not the view they hold. (Rutter & Yule 75.) IQ, they admit, is not a measure of potential, and it can be environmentally modified. The interpretation which they prefer is one of regarding IQ as a good measure of present intellectual functioning, and as such, a valid predictor of attainment in educational contexts. On no occasion, unfortunately, is any attempt made to follow through the implications of this theoretical position for the practical activities described in conjunction with it. In particular, an estimate is lacking of the extent to which an environmentally influenced IQ could distort the findings presented, even though the authors themselves recognise that such an influence does exist.

(It is of interest to add at this point, that Yule and his colleagues are not alone in the habit of including in their papers a token paragraph propounding 'environmentalist' views of IQ then, duty done, proceeding with analyses which would not perturb the most ardent hereditarian. See Brandis & Henderson 70, Morris 66, Cane & Smithers 71, Rossi 65, Cullen 69.)

The most obvious criticism of Yule's work in this field is that it does injustice to the capabilities of certain children; this much has already been described. A second criticism, less immediate but no less important, is that it retards progress towards real understanding of adequate and inadequate achievement. If concern is only aroused when achievement is out of step with IQ, then factors which influence both variables will tend to be overlooked, and an overall depression of functioning will not be noticed, still less investigated.

Yule's method does have one important virtue, however, which is that his IQ manipulations are at least open to scrutiny; i.e., it would be possible in theory to ascertain the extent of any bias introduced into his calculations by an environmentally depressed IQ. Studies in which the IQ manipulation has taken place prior to the main investigation cannot unfortunately be checked in this manner; for example, studies which have used samples screened for IQ, or comparisons between groups or individuals matched on the basis of IQ.

As has already been said on a number of occasions, the causes of poor functioning are still quite inadequately understood. Further research is certainly required, not least in order that understanding might guide action more successfully than it has done in the past. What is not required, however, is more research on the same old 'competence versus performance' theme, approached from a new angle, and carried out with ever increasing statistical sophistication.

In the present study, it was possible to demonstrate that certain environmental variables were associated with poor performance on both attainment and intelligence tests, suggesting an overall depression of functioning. The relationship of whether or not a mother regularly heard her child read to the child's reading and intelligence test scores was particularly striking, and the suitability of this variable as the target behaviour in an intervention programme was discussed.

The strength of the relationship between 'child reads

to mother' and test score was quite unexpected. In fact, if statistical decision theory is correct, and experimental findings are evaluated according to how closely they tie in with previous opinion (see e.g., Edwards et al 63,) then the findings of the present study will be met in some quarters with nothing short of disbelief.

The present author's views may be expressed very simply: children who read to their parents at home are practising a skill, and practice improves performance. Such children are also likely to put extra effort into learning to read, because of the effect on their motivation of actively expressed parental interest. The further that discussion is removed from the bulk of previous educational opinion, the more plausible do these arguments become.

As far as intervention programmes are concerned, the very least which could be asked is that mothers who wanted to help their children by listening to them read should be allowed to do so. A more extreme step would be to encourage all mothers to give this sort of help, whether they were initially convinced of its value or not.

The present study looked at ordinary Dagenham schoolchildren, not a clinic sample, or a group selected as being at particular risk of school failure; yet as a group, the children's performance was poor, and so, in consequence, were their educational prospects. In these circumstances, ideas such as those expressed above, which hold out hope of improving performance - even if only for some children, and even if only for the time being - deserve to be given a try.

APPENDIX I

THE PILOT QUESTIONNAIRE

This appendix contains:

(a) A copy of the pilot interview schedule

(b) Details and examples of the coding categories developed to describe the data, together with details of the category mergings carried out for analysis purposes.

Pilot Interview Schedule

(All information recorded on separate sheets.)

Record

School

Date

Ascertain

Child's full name

Sex

Date of birth

Family size: sex and age of sibs

Then proceed:

Do you go out to work at all, Mrs. X?

And your husband - would you describe his present job please.

So perhaps we could start by talking about the sorts of things N does when he's not in school. On an ordinary school day, for instance, what does he do when he first comes out of school?

Is that a fairly regular pattern?

What else might he do?

Does he play in much at all?

When he plays outside, where does he usually go?

Anywhere else?

And does he usually play with a special little friend, or just whoever is around?

Do you have any idea what they do: I mean, does he take anything out with him when he goes?

Does he stay out for long spells?

Continue right through evening

What if it was a rainy evening, and he couldn't go out - what does he like to do best indoors?

Now lets think about weekends. A normal Saturday, say - what happens? Does he like a lie-in or does he get up about the same time?

Continue through Saturday and Sunday

(If not otherwise mentioned)
Do you find the time at weekends to get out anywhere much at all?

*** *** *** *** *** *** *** ***

Thinking about the television now. (You mentioned that he watches - certain programmes or certain times...) Would you say he was very keen on watching television?

What else does he watch?

Any other times?

Of course, TV can be quite useful to mothers sometimes: I mean, do you find it helpful in keeping him out from under your feet?

Thinking a bit about school now. Do you find that N likes to tell you much about school?

(If no)
Does he like you to ask?

Does he ever get on your nerves with it sometimes - going on and on, I mean?

Would he tell you about it if the teacher said he'd done a specially good drawing or something that day?

What do you have to do then?

(Linking question)
Do you find that, in general, he's a kiddie who needs praising up a lot?

Thinking about trying to get N to behave as you'd like; which would you say works best with him, explaining and coaxing, or do you have to be firm?

(Linking question)
Thinking about N first starting school now. Did he need a lot of encouragement from you?

How about the work side - learning to read and so on?

(If not explicitly mentioned)
Did he ever like you to read to him at all?

And now?

When N was younger, did you ever listen to him read at all?

Do you ever/still do that now?

(Linking question)
People often say, like father like son, or like mother like son/daughter for that matter. Do you remember when you were at school, did you like English and reading much, or did you prefer P.E., that sort of thing?

Do you ever enjoy a book or magazine nowadays, or would you rather relax with the television?

How about your husband - is he a man who enjoys a book now and again, or would he rather have the TV, or a paper?

Thinking about N's Daddy a bit more; does he have time to give N/the kids much attention?

What sort of things do they do together?

(Linking question)
Back to N again. Would you say he was a talkative child?

Do you find you have the time to chat to him when he wants you to?

(If M's response not clear)
What do you usually do?

(Linking question)
Last few questions about school now. Do you know the teachers round there, at all?

When do you see them?

I asked that because nowadays, with new methods of teaching reading and maths and so on, parents often feel more and more left out. Have you felt like that?

(If yes)
Did you feel like doing anything about it?

Last question coming up. I know N is only seven now, but have you thought about when he's older - would you like him to stay on at school at all, or do you think he's a bit young to say, just yet?

(At end of interview, code Typical/Atypical family circumstances.)

Pilot interview: coding categories

Information from Direct Questions.

Item No.	Variable and category names	Category examples	Category mergings
D1	TV programmes watched		
	(a) Regulated by mother	"I don't think they should sit there for hours on end. They like Sesame Street and Play School - and Jake and the Magic Box - to learn the different words - and cartoons. It's a Knockout they stay up for."	
	(b) Random	"She usually watches telly when she's indoors. Never has been a one for toys or nothing, J. She sat till ten o'clock the other night."	
D2	Amount of TV watched if fine weather		
	(a) Saturday morning or less	Category assignment based on mother's overall description of behaviour.	(b) merged with (c): there was no clear dividing line between these two categories in terms of mothers' regulation of behaviour; whereas (a) reflected a distinct and deliberate policy
	(b) A little in the evenings also		
	(c) A number of hours		
D3	Indiscriminate use of TV by mother to occupy children		
	(a) Disagree. Do not do this	"No problem -wouldn't put it on to get him out of my way - never really in the way. They're always there, aren't they?"	(b) merged with (a): (b) reflects a reluctance to use TV in the way described except as a last resort. (c) represents a completely different policy.
	(b) Sat.morning, rainy days only	"Saturday morning - the children's programmes - it helps to get them out from under my feet then."	
	(c) Agrees. Uses TV like this as much as possible	"Wouldn't be without it. When it's been broke, it's murder."	

Pilot interview: coding categories.... cont...

D4	Aspirations for child to stay at school beyond 16		
	(a) Emphatically keen	"She'll stay on alright, if I have to scrub doorsteps to keep her there."	(a) merged with (b); (c) merged with (d) and (e). (a) and (b) represent positive aspirations; the other categories represent a lack of positive aspirations.
	(b) Very keen if child is too	"For meself, I'd like him to stay on, but it's up to him - if he wanted a trade... You can't force a child, can you?"	
	(c) Leavesit to child, but 'not mind.'	"No, I'd leave that up to him really. Matter of choice what he wants to do sorta thing. If he wanted to leave, I'd let him. If he wanted to stay on, he could."	
	(d) Says will 'wait and see.'	"I've not thought about it. Let it take care of itself. Depends how a child develops."	
	(e) Wants child to leave	"I think meself they've had enought of school by fifteen - that last year they just mess about, don't they?"	
D5	Mother's own reading		
	(a) Reads a lot of books	"Oh, I read a lot. Magazines and books. Especially black magic - Denis Wheatley. Or history books - going back over the years."	(b), (c) and (d) merged. Only (a) represents the provision of a 'reading model' as an index of a home's 'cultural level.'
	(b) Says has no time but would like to	"I love reading but I don't get time. Can't get into a book. I sit and talk to my husband in the evening - no time to read."	
	(c) Magazine or newspaper only	"Only like read the newspaper. Woman's Own."	
	(d) Never reads or 'prefers TV'	"No, I don't think I've read in a long while."	
D6	Father's reading		
	(a) Reads a lot of books	"My husband has an enormous collection of books he's looked after since he was a child. He often reads and then D gets interested in a book."	
	(b) Technical books only	"Not novels. Just his motor books - new motors and road tests."	

Pilot interview: coding categories.... cont....

D6 cont...Father's reading

(c) Newspapers only	"His father likes a sports paper, that's all. He runs a football team."	(b), (c) and (d) merged on same grounds as D5 above.
(d) Never reads or 'prefers TV.'	"No - he likes the telly. Don't mind the paper, but he likes a look at the telly."	

D7 Mother's willingness to chat

(a) Enjoys chat	"Yes, with both it's ceaseless chatter. I've always spoken to them since they were born, so I think it's my fault. Some Mums never talk to their kids."	
(b) Neutral	"To be honest,with four I let them do the talking."	
(c) Tells child to stop	"Sometimes he gets on your nerves. Especially if you're doing something - he keeps on and on. Yes, I do tell him to stop then."	(b) merged with (c). Only (a) reflects the belief that talking to children is a worthwhile activity in its own right.

D8 Mother's familiarity with school and teachers

(a) Knows teachers; sees them often.	"I always go round to the school and help. Went to the zoo and the dancing festival. I'm well known round there. I know all the teachers."	(b) merged with (c) Attendance at Open Days was almost universal. The mothers of interest were those who had extended their contact with the school on their own initiative.
(b) Open Days only	"When they send for you. I go to Open Day - about work and that."	
(c) Never go to school or see teachers	"I've never been over the school really. They don't have Open Days for the little ones."	

D9 Familiarity with school work

(a) Has actively sought information on at least one occasion.	"I went there about one thing. D was on one book that he used to bring home, and then he stopped. I went to ask why. The teachers said they learn to read by writing. I was disturbed about it - doubts creep in. So I tackled the visitor to the parents meeting about it - about illiteracy."	

Pilot interview: coding categories... cont...

D9 Cont/	Familiarity with school work		
	(b) Other	"Don't know really. Cos the way we were taught was different. You can just teach 'em to add and write and that, cos the other ways it's so different from when we were at school."	
D10	Mother's interest in school news		
	(a) Encourages child to tell her news from school each night	"He comes in and has a cup of tea and a biscuit. I ask him about school always - it's a thing we've always done."	(b) merged with (c). Only (a) reflects a positive interest in what the child does when he is at school.
	(b) Listens, but not very interested	"Just certain things. He doesn't come home with it every day. If there was something he was pleased about - then he'd tell you."	
	(c) Actively discourages news of school	"No not really. No I don't ask. If you show anything, he shows off."	
D11	Disciplinary method		
	(a) Explaining and coaxing	"Try and explain why you want them to. That's not to say I don't have a go at times. But - try and have a little talk to her."	(b) merged with (c). Only in (a) is the child given access to the reasons underlying the restrictions placed on his behaviour.
	(b) 'Firmness', i.e., just gives orders	"If he was to do anything wrong, I say you're not going out to play. If I shout or speak firmly to him, he do take notice."	
	(c) Explicitly physical	"I'm fed up with shouting at him and hitting him. I just shut him in the bedroom and not let him out."	
D12	Mother's response to good news from school		
	(a) Emphatic, makes a fuss	"You've got to take a great interest - be a bit over-enthusiastic. I think it helps to push them on if you can take an interest. Say, aren't you clever - and he'll go on to do a bit more."	

D12 Cont...	Mother's response to good news from school cont...		
	(b) Just say 'good'	"I just tell her good or whatever."	(b) merged with (c). The aim of this item was to distinguish the enthusiastic mothers from the rest. Only category (a) represents the enthusiastic response.
	(c) Unenthusiastic	"She brings her drawings home - says have you looked and you say yes and that's all - no fuss."	
D13	Mother reading to child		
	(a) Does regularly still	"She likes a book read to her of a night-time, especially if her Dad's at work. I read a chapter to her."	(b) merged with (c). Only (a) represents a sustained commitment to providing a child with this type of reading experience at home.
	(b) Used to, occasionally now	"I used to read him the odd story. Not so much now - I let him get on with it. He has his annuals and that upstairs."	
	(c) Never have	"No. She asked me once and I said no, cos it makes me tired. I start to yawn."	
D14	Child reading to mother		
	(a) Does regularly still	"Oh yes. We believe in encouraging them. We bought all the Ladybird books. She'd much rather do something with me from a book than play."	
	(b) Used to regularly - child prefers to read on own now	"With reading books, I used to sit with her a lot. We'd go through a book a day. I used to praise her up - I want to see a new one next week, I'd say. At one stage, she wanted you to listen to her. Not now. She wants to get on with it herself. She reads herself - newspapers, books, - not comics."	
	(c) Whenever brings school-book home - does so now and again	"They used to give 'em a reading book and we used to learn her. But now - she very seldom brings books home. I asked the teacher and she said she's getting on alright - it's not school policy to bring books home she said. When she does bring a book, we teach her the words."	

Pilot interview; coding categories ... cont...

D14 Cont...	Child reading to mother cont...		
	(d) Used to in the past	"He used to read to me every night. As he's got on - no, not now, no."	(a) merged with (b); (c) merged with (d) and (e). (a) and (b) represent a positive and sustained commitment to giving help with reading at home; the supply of help being dependent on the mother's initiative, and not on that of the school
	(e) Never has	"Not really. I prefer teachers to teach 'em. When they come home, they've had enough for the day."	
D15	Attention from Dad		
	(a) Children do get attention	"Daddy and D are good friends. He spends as much time as he can with the kiddies. He comes in from work about six - we have a talk and then they set on him - they ride on his back, fight, talk about school."	(b) merged with (c). Only (a) represents a pattern of regular father-child interaction.
	(b) Would if had the time, or sometimes	"Not really, no. He doesn't mind 'em at this age, but he's not got much time to spend - shifts and that."	
	(c) Not really	"He's never been one for the kids. Has a play now and again. Bit rough, he is. And strict. Leaving more and more to me lately."	
D16	Activities with Dad		
	(a) Child-centred	"He's teaching them Japanese words - for karate. He's going to take him to the karate exhibition. And they've been banger racing - and stock cars - and motor bikes."	(b) merged with (c). Only (a) represents deliberate father involvement in child-rearing.
	(b) Adult-centred - the 'club' or visiting relatives.	"On a Sunday he takes them over their Nanny's in Dagenham."	
	(c) None	"He's not the type to concentrate on the kids. I do everything for them, always have."	

Information from the account of leisure-time activities

Item No	Variable and category names	Category examples	Category mergings
L1	Play habits		
	(a) Plays outdoors for larger part of evening.	"He's usually out to play from the time he comes home until bed. He's a proper little street-urchin. Doesn't bother with tea - have to start that when he comes in - about 8.30."	
	(b) Plays indoors for larger part of evening	No examples	
L2	Time before bed		
	(a) Interacting with mother	"They're not in till bedtime - seven or half past. Ready for bed. Then they have a story - talking and tripping in and out of bed a few times."	(b) merged with (c). Only (a) represents deliberate adult-child interaction, in child-centred activities.
	(b) Playing or straight to bed	"When she's in, she plays with her dolls - talks to 'em. Plays schools with her dolls. Argues with her sister. It's dolls mainly - and teddies."	
	(c) Watching TV	"Comes in about 8 or half past. Normally wants something to eat. Bath, little bit of telly, then bed."	
L3	Rainy evening - mother participation		
	(a) Even briefly	"I play snap with them. And I'm trying to teach them rummy. Or we draw and cut out things and stick them on the walls."	
	(b) Not at all	"They've got a snooker table. And an Action Man - he plays with that quite a lot. And he plays cards with (brother)."	

Information from the account of leisure-time activities... cont...

L4	Saturday leisure-time with an adult		
	(a) Some time spent with adult	See L5a and L5b below	
	(b) 'Plays out' all the time	"She plays out. If she can't get out into the the street with her friends, she's hard to amuse. I think if she wants to come in, she'll come in. I wouldn't force her - she's a child who likes to be out."	
L5	Saturday - if go out with an adult		
	(a) Activity is child-centred	"He goes shopping with me - he likes that. I take him into Romford - we have to go into Smiths - smashing shop. Daren't go past Smiths - he likes the Airfix models."	(b) merged with (c). Only (a) represents deliberate adult-child interaction in child-centred activities.
	(b) Shopping, visiting	"On a Saturday, I go to work. My sister-in-law has him. He goes shopping with her, then plays with the kids on the green."	
	(c) Not go out with adult	"He don't lie in, more's the pity. He watches telly Saturday morning, then he goes over the park with (brother). Plays out more than anything."	
L6	Saturday - father present and active		
	(a) Father and child go out together or play together	"He watches TV all morning then he goes to the club (Working Men's Club) round the corner with my husband."	
	(b) No such interaction with Father	Defined by exclusion	

Information from the account of leisure time activities... cont...

L7	Sunday leisure-time with an adult		
	(a) Some time spent with adult	See L8a and L8b below	
	(b) 'Plays out' all the time	"Sunday he's up late. Watches telly for a while then out to play. He's in at 3.30 for dinner, then out again."	
L8	Sunday - if go out with an adult		
	(a) Activity is child-centred	"Sundays we go out - Hainault Forest or the zoo. Or we take them to the park with their bikes - they're not allowed on the street with the bikes - so it's just to get them out and let them run wild."	(b) merged with (c). Only (a) represents deliberate adult-child interaction in child-centred activities.
	(b) Visiting only	"Sunday my husband takes them down his brothers."	
	(c) Not go out with adult	"He just goes out and plays Sundays, you know. Once in a while we might visit relatives."	
L9	Sunday - Father present and active		
	(a) Father and child go out together or play	"Sunday they do gardening with their Father and get in his way."	
	(b) No such interaction with Father	Defined by exclusion.	
L10	Weekend evenings		
	(a) Child-centred	"On a Saturday evening, we go across the Thames ferry and back, or to St. James' Park, or up the woods."	(b) merged with (c) and (d). Only (a) represents deliberate adult-child interaction in child-centred activities.
	(b) Out with parents - the 'Club' or visiting	"In the evening, we go over the Working Men's Club. Never see hide nor hair of 'em - he goes off with his mates and plays on the green."	
	(c) TV or playing in	"Saturday evening? Watches TV mostly - not out much then."	
	(d) Playing out	"In the afternoon he likes to play out. In the evening - yeah same then. Same as before."	

Information from the account of leisure time activities ... cont...

L11	Some indoor play in the evenings		
	(a) Plays in some of the time	"Comes in for tea. Very seldom watches TV. Then he'll do a drawing, or I read to him."	
	(b) Plays out all evening	"He's back for tea then out again. Don't see much of him really - stands up for himself. Only comes in to be fed and put to bed."	
L12	Plays where		
	(a) In garden only	"Don't allow him out in the street to play at all. Most round here do, but I've seen too many near misses."	(a) merged with (b), on the grounds that (a) and (b) both represent firm rules, whereas (c) represents no rules.
	(b) In immediate vicinity only	"Won't let him go far - only round the block."	
	(c) Permitted to go further away	"He's been over the new Adventure Park in Rainham (2 miles) today with all his friends."	
L13	Plays with whom		
	(a) Known to Mother - sibs, alone, or with named friends only	"There's two boys in his class usually come up for him. And N along there. And JP - they're great friends now."	
	(b) Unknown to Mother - usually an unspecified group	"Mostly general children. Around the block. No special block."	
L14	Plays out for how long		
	(a) Child 'pops back' frequently on Mother's encouragement	"In and out sort of thing. All the time - every ten minutes. Rather have 'em in and out. Can always say, where've you been? Better that than disappearing altogether."	
	(b) Mother unconcerned if child out for long periods at a stretch	"He vanished for four hours on Monday - he'd gone over the racetrack. Lately not known where he's gone - comes in at nine."	

APPENDIX 2

THE SOUTHGATE READING TEST

Choice of test

The reading test used in the pilot study was the Southgate Test 1A. (Tests 1B and 1C are parallel forms of Test 1A, while Test 2 is for use with older children.) Restrictions on the choice of reading test for use in the pilot were twofold:-

(a) the chronological age of the children in the study. (6:11 to 7:09)

(b) shortage of resources. This meant that children had to be tested in groups rather than individually.

Only three published tests met both conditions; Carver's 'Word Recognition Test' (Carver 70), Young's 'Group Reading Test' (Young 68), and the 'Southgate Group Reading Test 1' (Southgate 59.)

The Southgate was chosen because previous surveys had used it, and had published findings useful for comparative purposes (Butler 71, Berger & Yule 71, Davie et al 72.) Information of this kind from other studies was not available for either the Carver or the Young tests.

The Southgate Test 1 : description and testing procedure.

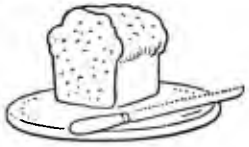
To quote from Vernon's description of the test in the 'Reading' section of the 'Mental Measurements Yearbook' (Vernon 65):

> "In Test 1, a test for word recognition, the children, who can be tested in groups up to 20, have to select from five alternatives the word spoken to them in each item. In 16 out of 30 items the correct word is also illustrated by a picture. Preliminary examples are given for practice. There is no time limit for the test, but it normally takes 15-20 minutes."

A copy of the test (photographically reduced in size) is given in Fig. A1. The child rings the selected word. Items in which more than one word has been ringed receive no credit. The number of items answered correctly gives the Raw Score for the test. (This was the figure used in all the

analyses.)

Further details of the test administration and marking procedures are given in the published Test Manual. (Southgate 59.)

21.		handle apple under among anchor
22.		bead bright broad bed bread
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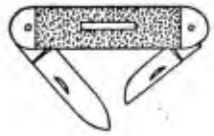
27.		know nine knit wife knife
28.		thread three threat third through
29.		left live luck laugh love
30.		sticking stocking stroking stifling striking

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Fifteenth impression 1975
Ch.P. 1975

Southgate Group Reading Tests

TEST I (Form A) — Word Selection

Name .....

School .....

Class .....

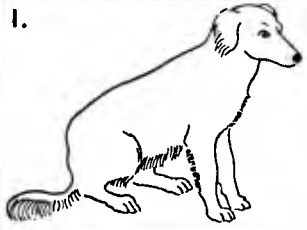
Today's Date .....

Date of Birth .....

Chronological Age .....

Raw Score	Reading Age

PRACTICE EXAMPLES

1.		did good dinner yes dog
2.		fat sat hat mat him

3.	in easy see is ice
4.	got get great gate goat

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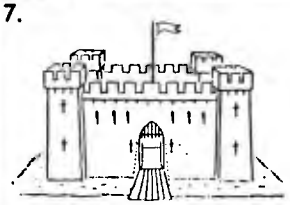
7. 
   call
   cuddle
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   coast
   kill

8. 
   cake
   coat
   kettle
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   cot

9. she
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   chest

10. ten
    net
    ton
    not
    note

11. 
    fog
    frog
    from
    fly
    flag

12. 
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    into
    eagle
    eggs

13. 3
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14. hem
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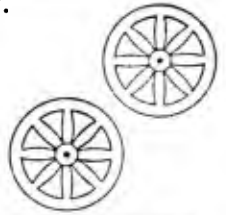
17. 
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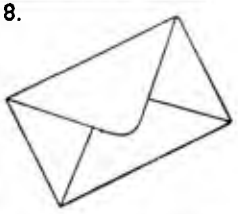
18. 
    envelope
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19. white
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20. though
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APPENDIX 3

SUPPLEMENTARY ANALYSES OF THE PILOT STUDY DATA

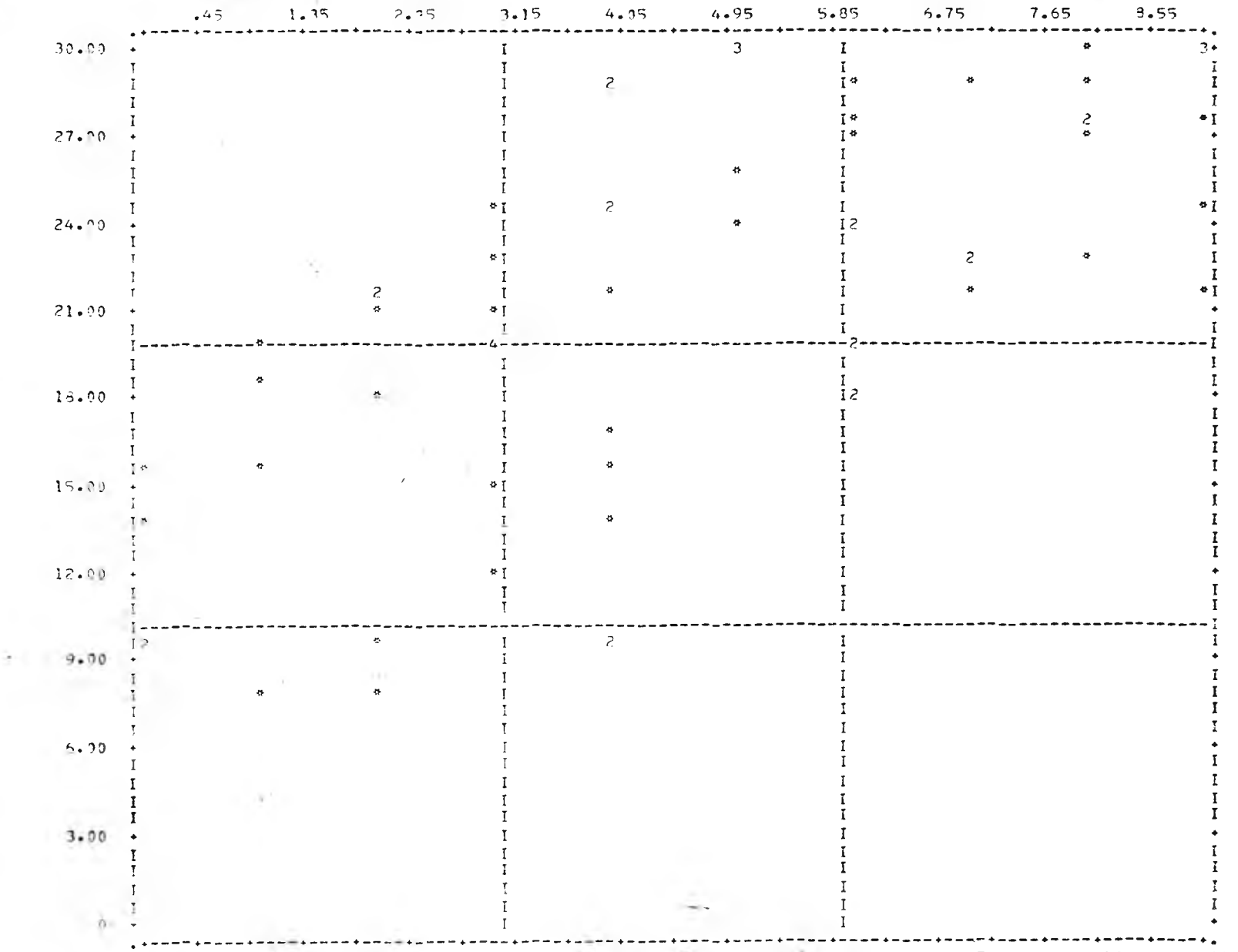
This appendix contains:

(a) A scattergram of Southgate reading test score against Child-rearing Inventory score. (Figure A2)

(b) Analyses of Variance, using the 'Mother reads to child' (MtoC) variable, for comparison with the parallel series based on 'Child reads to mother', given in the text. (See Tables 30,34,35,41 and 42.)

The two sets of analyses produced very similar results: the effects of the 'Chat' and 'Class' variables on reading were much reduced when 'MtoC' (or 'CtoM') was taken into account, and reduced still further - to below statistical significance - when allowance was also made for the effect of Child-rearing Inventory score. (Tables A1 to A4). The school effect was however reduced only marginally by the procedures described, and remained significant beyond the .005 level. (Tables A5 and A6).

Figure A2. SCATTERGRAM OF (DOWN) SGATE SOUTHGATE READING TEST SCORE (ACROSS) CRINVEN CHILD REARING INVENTORY SCORE



CORRELATION (R)= .66761 R SQUARED = .44571 SIGNIFICANCE R = .00001

Table A1. Analysis of Variance: Reading score by MtoC x Chat

```
* * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * *
            SGATE     SOUTHGATE READING TEST SCORE
         BY MTOC      MOTHER READS TO CHILD
            CHAT      MOTHERS WILLINGNESS TO CHAT
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

SOURCE OF VARIATION                  SUM OF SQUARES     DF     MEAN SQUARE       F    SIGNIF OF F

MAIN EFFECTS                           1152.175          2       576.088     24.539      .001
   MTOC                                 631.017          1       631.017     26.878      .001
   CHAT                                  22.389          1        22.389       .954      .333

2-WAY INTERACTIONS                       17.550          1        17.550       .748      .391
   MTOC      CHAT                        17.550          1        17.550       .748      .391

EXPLAINED                              1169.726          3       389.909     16.608      .001

RESIDUAL                               1385.131         59        23.477

TOTAL                                  2554.857         62        41.207
     63 CASES WERE PROCESSED.
      0 CASES (    0 PCT) WERE MISSING.


* * *  M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S  * * *
            SGATE     SOUTHGATE READING TEST SCORE
         BY MTOC      MOTHER READS TO CHILD
            CHAT      MOTHERS WILLINGNESS TO CHAT
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =    21.62

                                                                                ADJUSTED FOR
                                        UNADJUSTED      ADJUSTED FOR INDEPENDENTS INDEPENDENTS
VARIABLE + CATEGORY                  N    DEV'N  ETA      DEV'N  BETA  + COVARIATES DEV'N  BETA

MTOC
    0 USED TO OR NEVER              38    -3.43           -3.11
    1 DOES STILL                    25     5.22            4.72
                                                .66                .60

CHAT
    0 UNWILLING OR PASSIVE          41    -2.11           -.53
    1 LIKES TO CHAT                 22     3.93            .98
                                                .45                .11

MULTIPLE R SQUARED                                                 .451
MULTIPLE R                                                         .672
```

Table A2. Analysis of Variance: Reading score by MtoC x Chat with Inventory score as covariate

```
* * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * *
            SGATE     SOUTHGATE READING TEST SCORE
         BY MTOC      MOTHER READS TO CHILD
            CHAT      MOTHERS WILLINGNESS TO CHAT
       WITH CRINVEN   CHILD REARING INVENTORY SCORE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

SOURCE OF VARIATION                  SUM OF SQUARES     DF     MEAN SQUARE       F    SIGNIF OF F

COVARIATES                             1138.713          1      1138.713     55.757      .001
   CRINVEN                             1138.713          1      1138.713     55.757      .001

MAIN EFFECTS                            228.916          2       114.458      5.604      .006
   MTOC                                 197.092          1       197.092      9.651      .003
   CHAT                                    .468          1          .468       .023      .880

2-WAY INTERACTIONS                        2.710          1         2.710       .133      .717
   MTOC      CHAT                         2.710          1         2.710       .133      .717

EXPLAINED                              1370.339          4       342.585     16.775      .001

RESIDUAL                               1184.518         58        20.423

TOTAL                                  2554.857         62        41.207
     63 CASES WERE PROCESSED.
      0 CASES (    0 PCT) WERE MISSING.
```

Table A3. Analysis of Variance: Reading score by MtoC x Class

* * * * * * * * * * A N A L Y S I S O F V A R I A N C E * * * * * * * * * *

SGATE SOUTHGATE READING TEST SCORE
BY MTOC MOTHER READS TO CHILD
CLASS SOCIAL CLASS

* *

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS	1285.107	3	428.369	19.767	.001
MTOC	736.524	1	736.524	33.987	.001
CLASS	155.320	2	77.660	3.584	.034
2-WAY INTERACTIONS	34.510	2	17.255	.796	.456
MTOC CLASS	34.510	2	17.255	.796	.456
EXPLAINED	1319.617	5	263.923	12.179	.001
RESIDUAL	1235.240	57	21.671		
TOTAL	2554.857	62	41.207		

63 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

* * * M U L T I P L E C L A S S I F I C A T I O N A N A L Y S I S * * *

SGATE SOUTHGATE READING TEST SCORE
BY MTOC MOTHER READS TO CHILD
CLASS SOCIAL CLASS

* *

GRAND MEAN = 21.62

VARIABLE + CATEGORY	N	UNADJUSTED DEV'N	UNADJUSTED ETA	ADJUSTED FOR INDEPENDENTS DEV'N	ADJUSTED FOR INDEPENDENTS BETA	ADJUSTED FOR INDEPENDENTS + COVARIATES DEV'N	ADJUSTED FOR INDEPENDENTS + COVARIATES BETA
MTOC							
0 USED TO OR NEVER	38	-3.43		-2.97			
1 DOES STILL	25	5.22		4.51			
			.66		.57		
CLASS							
1 NON MANUAL	14	3.60		1.76			
2 SKILLED MANUAL	21	1.90		1.31			
3 SEMI AND UNSKILLED	28	-3.23		-1.86			
			.46		.26		

MULTIPLE R SQUARED .503
MULTIPLE R .709

Table A4. Analysis of Variance: Reading score by MtoC x Class with Inventory score as covariate

* * * * * * * * * * A N A L Y S I S O F V A R I A N C E * * * * * * * * * *

SGATE SOUTHGATE READING TEST SCORE
BY MTOC MOTHER READS TO CHILD
CLASS SOCIAL CLASS
WITH CRINVEN CHILD REARING INVENTORY SCORE

* *

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
COVARIATES	1138.713	1	1138.713	59.168	.001
CRINVEN	1138.713	1	1138.713	59.168	.001
MAIN EFFECTS	309.891	3	103.297	5.367	.003
MTOC	193.540	1	193.540	10.056	.002
CLASS	81.443	2	40.722	2.116	.130
2-WAY INTERACTIONS	28.502	2	14.251	.740	.481
MTOC CLASS	28.502	2	14.251	.740	.481
EXPLAINED	1477.106	6	246.184	12.792	.001
RESIDUAL	1077.751	56	19.246		
TOTAL	2554.857	62	41.207		

63 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

Table A5. Analysis of Variance: Reading score by MtoC x School

```
* * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * *
            SGATE    SOUTHGATE READING TEST SCORE
         BY MTOC     MOTHER READS TO CHILD
            SCHOOL
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

SOURCE OF VARIATION                  SUM OF SQUARES     DF     MEAN SQUARE       F     SIGNIF OF F

MAIN EFFECTS                           1313.740          2       656.870      32.650     .001
   MTOC                                1086.561          1      1086.561      54.004     .001
   SCHOOL                               183.954          1       183.954       9.144     .004

2-WAY INTERACTIONS                       54.129          1        54.129       2.691     .106
   MTOC      SCHOOL                      54.129          1        54.129       2.691     .106

EXPLAINED                              1367.869          3       455.956      22.664     .001

RESIDUAL                               1186.988         59        20.118

TOTAL                                  2554.857         62        41.207
     63 CASES WERE PROCESSED.
      0 CASES (     0.PCT) WERE MISSING.


* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
            SGATE    SOUTHGATE READING TEST SCORE
         BY MTOC     MOTHER READS TO CHILD
            SCHOOL
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =    21.62

                                                ADJUSTED FOR                ADJUSTED FOR
                                 UNADJUSTED     INDEPENDENTS                INDEPENDENTS
VARIABLE + CATEGORY          N   DEVIN   ETA    DEVIN   BETA                + COVARIATES
                                                                            DEVIN   BETA

MTOC
    0 USED TO OR NEVER      38    -3.43          -3.37
    1 DOES STILL            25     5.22           5.13
                                          .66                 .65

SCHOOL
    1                       31     1.93           1.74
    2                       32    -1.87          -1.68
                                          .30                 .27

MULTIPLE R SQUARED                                  .514
MULTIPLE R                                          .717
```

Table A6. Analysis of Variance: Reading score by MtoC x School with Inventory score as covariate

```
* * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * *
            SGATE    SOUTHGATE READING TEST SCORE
         BY MTOC     MOTHER READS TO CHILD
            SCHOOL
       WITH CRINVEN  CHILD REARING INVENTORY SCORE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

SOURCE OF VARIATION                  SUM OF SQUARES     DF     MEAN SQUARE       F     SIGNIF OF F

COVARIATES                             1138.713          1      1138.713      68.099     .001
   CRINVEN                             1138.713          1      1138.713      68.099     .001

MAIN EFFECTS                            387.982          2       193.941      11.598     .001
   MTOC                                 231.121          1       231.121      13.822     .001
   SCHOOL                               159.435          1       159.435       9.535     .003

2-WAY INTERACTIONS                       58.414          1        58.414       3.493     .067
   MTOC      SCHOOL                      58.414          1        58.414       3.493     .067

EXPLAINED                              1585.009          4       396.252      23.697     .001

RESIDUAL                                969.848         58        16.722

TOTAL                                  2554.857         62        41.207
     63 CASES WERE PROCESSED.
      0 CASES (     0 PCT) WERE MISSING.
```

APPENDIX 4

INTERVIEW SCHEDULE FOR THE FIRST JUNIOR SCHOOL STUDY

Notes

(a) Question 11 was inserted for 'linking' purposes only, and responses to it were not analysed.

(b) Responses to the two parts of Question 13 were pooled to produce a single two-way coding:

Emphatic that child tells or M asks / Other

(c) Similarly, the two parts of Question 14 were combined as follows:

M makes a fuss / Other

(d) An additional response category was found to be necessary for both Questions 16 and 17; 'Help now, didn't before.'

(e) Questions 8, 9, 10, 12, 13, 14, 15, 19 and 20 are the nine items from the 'Child-rearing inventory.' The first seven questions mentioned were only given dichotomous codings from the beginning: Questions 19 and 20 were recoded as dichotomies by collapsing the last two coding categories into one.

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THOMAS CORAM RESEARCH UNIT

SCHOOL.....

DATE .....

1. Are you Mrs. X, N's mother?

2. Could you give me N's full name please?

Code Boy/Girl

3. Does N have any brothers and sisters? Could you give me their ages please?

Age.....

Sex.....

4. Do you go out to work at all, Mrs. X?

Not working / Part-time / Full-time

5. Would you describe your present job please.

6. Did you have a job before you had children? (details)

7. And your husband: would you describe his present job please.

At end of this section, code Circs. Typical / Atypical

*** *** *** *** *** *** *** *** ***

Perhaps we could start by talking about the sorts of things N does when he's not in school.

8. If he goes out to play after school, where does he usually go?

In garden or immediate vicinity / Further away

9. Does he usually play with a special little friend, or just whoever is around?

Named friend or alone / Unspecified

10. When he's out playing, do you prefer him to keep popping back every now and again, or are you happy for him to go off for spells, now that he's older?

Popping back / Out for spells

11. Thinking now about when he's indoors, would you say he was very keen on watching television?

No / Conditional Yes / Emph. Yes

12. Of course, TV can be quite useful to mothers: I mean, do you find it helps to keep him out from under your feet sometimes?

Disapproval or specified occasions only / Unqualified approval (or would if it worked)

*** *** *** *** *** *** *** *** *** ***

13. Thinking a bit about school now: do you find that N tells you much about school?

Emphatic Yes / Other

IF other:

Do you ask at all, or do you not have time to bother very much with that sort of thing?

Always ask / Other

14. Would he tell you about it if the teacher said he'd done a specially good drawing or something that day?

Unconditional yes / Other

(If no mention of M's response)

What do you do then?

Make a fuss / Other

*** *** *** *** *** *** *** ***

15. Thinking about trying to get N to behave as you would like, which would you say works best, explaining and coaxing, or do you have to be firm?

Explaining and coaxing / Firmness

*** *** *** *** *** *** *** *** ***

16. Thinking a bit more about school and school work: has N ever liked you to read to him at home at all?

Regularly read still / Have read in past / Never have read

17. How about you listening to him read. Do you ever do that at all nowadays?

Regularly still / Used to but child prefers to read on own now / Only if bring book home / Have done in past / Never have

18. People often say, like father like son, or like mother like son/ daughter for that matter: do you enjoy a magazine or a book much these days, or would you rather relax with the TV?

Reads a lot of books / No time / Magazine or paper / Prefers TV

19. Last few questions about school now. Do you know the teachers at the school round there very well?

Open Days plus / Open Days only / Not at all.

20. I asked that because nowadays, with new methods of teaching reading and maths and so on, parents often feel more and more left out: have you ever felt that way at all?

Did but found out / Yes, do / No

21. I know N is only seven/eight now, but have you thought about when he's older - would you like him to stay on at school at all?

Yes, if N wants to / Wouldn't mind / Wait and see, or want N to leave

22. If N did stay on, would he be taking after you that way - did you want to stay on at school at all?

Left as soon as could / Left but regret it / Any education beyond minimum

'Chat' Scale

Children often chatter quite a lot. Could you tell me what you usually do if N starts chattering in the following places?

		(a)	(b)	(c)	(d)
1.	When you are working around the house				
2.	When you are walking along the street				
3.	When you are trying to relax				
4.	When you are talking to your husband				
5.	When you are in a shop				
6.	When you are in a 'bus or tube				
7.	At meal-times				

Responses

(a) Tell him to stop

(b) Tell him to wait

(c) Answer him quickly

(d) Chat with him

'Awkward Questions' Scale

Finally, thinking about some of the questions that children often ask, could you tell me what you would be most likely to do first if N asked these questions:

		(a)	(b)	(c)	(d)	(e)	(f)
1.	Why do we have rules						
2.	Why there are wars						
3.	Why boys are different from girls						
4.	Why some people are mentally disturbed						
5.	Why some people are rich and others poor						
6.	Why some people are physically disabled						
7.	Daddy's part in making babies						
8.	Why people die						

Responses

(a) Make up something until he's older

(b) Tell him to ask Daddy

(c) Try and change the subject

(d) Take the opportunity to discuss the matter with him

(e) Tell him he's not old enough to understand

(f) Give him a brief answer and see if he's satisfied

APPENDIX 5

THE NFER READING TEST 'A'

In the test manual (NFER 73) it is stated that, "Reading test A is a simple test of reading comprehension of the sentence completion type. It is designed for use with children in their first year of the junior school."

The test, which is printed in an eight-page booklet, is comprised of 38 items, graded in difficulty. The child has to select the correct work or phrase from four alternatives. The test is preceded by four practice items, printed on the front of the booklet. These are provided "... in order to familiarize the children with the tasks (the test) presents and with the method of responding required." (NFER 74). The tester goes through the practice items one by one with the children, who then work their way through the items of the test proper at their own speed. There is no time limit, but the test manual states that "... most children can do the test in half an hour," and recommends that testers use their discretion in deciding whether children who have not finished in this time would profit from being allowed to work longer.

Each item answered correctly gains one mark. No credit is given for items where more than one response has been indicated. Using a conversion table printed in the test manual, a child's raw score and age (in years and completed months) are converted into a standardised score: this is a measure of how well the child performed compared to a sample of children of exactly the same age.

The details of the standardisation sample used for the test are somewhat obscure. The 1974 edition of the NFER's test catalogue, and the test manual, published in 1973, state that the sample size was about 7000; while the 1978 catalogue refers to "a sample of about

5,500 children." In a review of reading tests published in 1976, Pumfrey described the normative data available for the NFER 'A' as "provisional." Taken together with the lack of published data from any other study using the test, this suggests that the normative aspect of reading performance assessments obtained using test A should be viewed with caution.

To illustrate the style and difficulty level of the test, the first two, and last two pages of the test booklet are reproduced in Figure A3, photographically reduced in size. (The original test is printed on A4 size paper.)

National Foundation for Educational Research in England and Wales

332093

READING TEST A

FILL IN THE FOLLOWING PARTICULARS:

NAME BOY OR GIRL

SCHOOL CLASS

TODAY'S DATE 19

Not to be filled in by pupil					
Age		Raw Score			Standardized Score
Years	Completed Months	R	W	O	
					Initials of Marker
Check R + W + O = 38					

A. I see the_____.	1. not 3. got 2. dog 4. and
B. Come_____with us.	1. out 3. post 2. book 4. big
C. The_____can read.	1. play 3. book 2. boy 4. read
D. The dog_____.	1. and got 3. for the 2. can play 4. the big

1

1. My_____cat likes to drink milk from a saucer.	1. green 2. flying 3. ginger 4. late
2. The hungry mice gnawed the _____in the pantry.	1. warmth 2. cream 3. cheese 4. milk
3. I need_____to write this letter to my sister.	1. paper and a pen 2. too much water 3. a list and a rubber 4. two more saucepans

25. With sirens wailing, the fire engine arrived at the farm and the firemen started to _____.
1. ready to help
2. began to water
3. put out the fire
4. light the blaze

26. The children went to the beach to _____ _____ for their collection.
1. watch the waves
2. play with their friends
3. swim in the ocean
4. find sea shells

27. Every Sunday morning the villagers could hear the great church bells _____ across the valley.
1. crying
2. streaming
3. playing
4. ringing

28. _____ in the morning, as I told her you would come.
1. Far away soon
2. Keep your feet
3. Please see her
4. Lose yourself

29. When the train pulled away from the station, we _____ the people on the platform.
1. greeted
2. waved to
3. exclaimed over
4. saw them

30. After he had eaten _____ Tim was so full that he felt ill.
1. three plain biscuits
2. six large cakes
3. five strawberries
4. two boiled sweets

31. The boy rowed the boat _____ _____
1. under the river
2. in the bathroom
3. with powerful strokes
4. into the sky

7

32. Mother asked us to _____ our dirty shoes outside on the steps.
1. please
2. pass
3. place
4. pair

33. He was very _____ when he saw the large audience waiting to hear him play the piano.
1. score
2. unusual
3. nervous
4. greedy

34. _____ he had played the best solo, he won the first prize in the competition.
1. While
2. Although
3. Because
4. Before

35. The sheep and cows in that field by the river _____ who lives near the bridge.
1. are all very young
2. belong to the farmer
3. are always hungry
4. never drink

36. _____ they ran out to play football on the field.
1. With heavy hearts
2. Laughing happily
3. Swinging their rackets
4. Changing feet

37. The little girl was a good dancer because she _____
1. was so graceful
2. was so beautiful
3. had enormous feet
4. was very grateful

38. With only minutes to decide the result of the match, the crowd _____ to see what would happen.
1. had to go away
2. clapped and cheered
3. screamed and guessed
4. watched intently

APPENDIX 6

DESCRIPTIVE ANALYSES OF FIRST JUNIOR SCHOOL STUDY DATA

This appendix is divided into three sections, containing:

(1) The full correlation matrix from the N = 100 sample. (After recoding of some demographic variables as dichotomies. For details, see text page 297 .)

(2) Descriptive analyses of the relationships between the demographic and the child-rearing variables. (For details of variable and category names and codings, see text pages 259-69 .)

(3) Descriptive analyses of the inter-relationships amongst the child-rearing variables. Excluded are analyses already described in detail in the text, and analyses already represented by the computing of correlation coefficients for tabulation in Section 1 above.

SECTION 1: Correlation matrix from N = 100 sample. (Table A7)

	SEX	CLASS	CIRCS	TOTALN	NOLDER	NYOUNGER	MWORKING	MCLASS	MEDUC	CRINVEN
SEX	1.0000	.0133	.0415	.0475	.0558	-.0124	-.0855	.0250	.0275	-.1889
	(0)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .001	S= .448	S= .341	S= .319	S= .291	S= .451	S= .199	S= .403	S= .393	S= .030
CLASS	.0133	1.0000	.1345	.1770	.0835	.1432	-.0940	-.0594	-.0857	-.0966
	(100)	(0)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .448	S= .001	S= .091	S= .039	S= .204	S= .078	S= .176	S= .279	S= .198	S= .170
CIRCS	.0415	.1345	1.0000	.0513	-.0695	.1843	-.1068	.1232	.0914	-.2992
	(100)	(100)	(0)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .341	S= .091	S= .001	S= .306	S= .246	S= .033	S= .145	S= .111	S= .183	S= .001
TOTALN	.0475	.1770	.0513	1.0000	.7853	.3310	-.1869	.1468	.1232	-.0712
	(100)	(100)	(100)	(0)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .319	S= .039	S= .306	S= .001	S= .001	S= .001	S= .031	S= .072	S= .111	S= .241
NOLDER	.0558	.0835	-.0695	.7853	1.0000	-.3243	-.0839	.1074	.1014	.0173
	(100)	(100)	(100)	(100)	(0)	(100)	(100)	(100)	(100)	(100)
	S= .291	S= .204	S= .246	S= .001	S= .001	S= .001	S= .203	S= .144	S= .158	S= .432
NYOUNGER	-.0124	.1432	.1843	.3310	-.3243	1.0000	-.1577	.0606	.0338	-.1352
	(100)	(100)	(100)	(100)	(100)	(0)	(100)	(100)	(100)	(100)
	S= .451	S= .078	S= .033	S= .001	S= .001	S= .001	S= .059	S= .275	S= .369	S= .090
MWORKING	-.0855	-.0940	-.1068	-.1869	-.0839	-.1577	1.0000	.1651	-.0898	-.0274
	(100)	(100)	(100)	(100)	(100)	(100)	(0)	(100)	(100)	(100)
	S= .199	S= .176	S= .145	S= .031	S= .203	S= .059	S= .001	S= .050	S= .187	S= .393
MCLASS	.0250	-.0594	.1232	.1468	.1074	.0606	.1651	1.0000	.1451	-.1377
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(0)	(100)	(100)
	S= .403	S= .279	S= .111	S= .072	S= .144	S= .275	S= .050	S= .001	S= .075	S= .086
MEDUC	.0275	-.0857	.0914	.1232	.1014	.0338	-.0898	.1451	1.0000	-.1312
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(0)	(100)
	S= .393	S= .198	S= .183	S= .111	S= .158	S= .369	S= .187	S= .075	S= .001	S= .097
CRINVEN	-.1889	-.0966	-.2992	-.0712	.0173	-.1352	-.0274	-.1377	-.1312	1.0000
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(0)
	S= .030	S= .170	S= .001	S= .241	S= .432	S= .090	S= .393	S= .086	S= .097	S= .001
CHAT	-.1914	-.1276	-.0732	-.1957	-.0910	-.1603	-.0700	-.1236	-.0021	.3525
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .028	S= .103	S= .235	S= .026	S= .184	S= .056	S= .244	S= .110	S= .492	S= .001
AWKOS	-.2101	-.0373	-.0556	-.1583	-.1413	-.0265	-.0804	-.1528	-.1117	.3809
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .018	S= .356	S= .291	S= .058	S= .080	S= .397	S= .213	S= .065	S= .134	S= .001
ASP	.0287	-.0985	-.1363	-.2255	-.2730	.0715	.0442	-.1655	-.3113	.2471
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .388	S= .165	S= .088	S= .012	S= .003	S= .240	S= .331	S= .050	S= .001	S= .007

(Table A7 cont.)

	SEX	CLASS	CIRCS	TOTALN	NOLDFR	NYOUNGER	MWORKING	MCLASS	MEDUC	CRINVEN
WTOM	-.0494	-.0496	-.0993	.1106	.2121	-.1543	.0223	-.2728	-.1568	.1515
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .313	S= .312	S= .163	S= .137	S= .017	S= .063	S= .413	S= .003	S= .060	S= .066
WTOC	-.0944	.0082	-.1373	-.1262	-.1272	.0012	-.0376	-.1159	-.2253	.3915
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .175	S= .468	S= .087	S= .106	S= .104	S= .495	S= .355	S= .125	S= .012	S= .001
CTOM	-.1781	-.0200	-.0912	-.1261	-.1151	-.0172	.0678	-.2160	-.2989	.3727
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .038	S= .422	S= .183	S= .106	S= .127	S= .433	S= .251	S= .015	S= .001	S= .001
VERBIQ	.2437	-.0857	-.1547	.0229	.1008	-.1186	-.1049	-.0322	-.2318	.2863
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .007	S= .198	S= .062	S= .410	S= .159	S= .120	S= .149	S= .375	S= .010	S= .002
PERFIQ	.1707	.0558	-.2270	-.0242	.0440	-.1041	.0114	-.1183	-.2200	.3840
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .045	S= .291	S= .012	S= .406	S= .332	S= .151	S= .455	S= .121	S= .014	S= .001
FULLIQ	.2417	-.0324	-.2059	-.0023	.0791	-.1241	-.0612	-.0781	-.2536	.3660
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .008	S= .375	S= .020	S= .491	S= .217	S= .109	S= .273	S= .220	S= .005	S= .001
VERA	-.0701	-.1663	-.0630	-.1497	-.1556	.0084	.0428	-.1077	-.2261	.4317
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .244	S= .049	S= .267	S= .069	S= .061	S= .467	S= .336	S= .143	S= .012	S= .001

(Table A7 cont.)

	CHAT	AWKQS	ASP	MTOM	MTOC	CTOM	VERBIQ	PERFIQ	FULLIQ	NFERA
SEX	-.1914	-.2101	.0237	-.0494	-.0944	-.1781	.2437	.1707	.2417	-.0701
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .028	S= .018	S= .398	S= .313	S= .175	S= .038	S= .007	S= .045	S= .008	S= .244
CLASS	-.1276	-.0373	-.0985	-.0496	.0082	-.0200	-.0857	.0558	-.0324	-.1663
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .103	S= .356	S= .165	S= .312	S= .468	S= .422	S= .198	S= .291	S= .375	S= .049
CIRCS	-.0732	-.0556	-.1363	-.0993	-.1373	-.0912	-.1547	-.2270	-.2059	-.0630
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .235	S= .291	S= .088	S= .163	S= .087	S= .183	S= .062	S= .012	S= .020	S= .267
TOTALN	-.1957	-.1583	-.2255	.1106	-.1262	-.1261	.0229	-.0242	-.0023	-.1497
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .026	S= .058	S= .012	S= .137	S= .106	S= .106	S= .410	S= .406	S= .491	S= .069
NOLDER	-.0910	-.1413	-.2730	.2121	-.1272	-.1151	.1008	.0440	.0791	-.1556
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .184	S= .080	S= .003	S= .017	S= .104	S= .127	S= .159	S= .332	S= .217	S= .061
NYOUNGER	-.1603	-.0265	.0715	-.1543	.0012	-.0172	-.1186	-.1041	-.1241	.0084
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .056	S= .397	S= .240	S= .063	S= .495	S= .433	S= .120	S= .151	S= .109	S= .467
NWORKING	-.0700	-.0804	.0442	.0223	-.0376	.0678	-.1049	.0114	-.0612	.0428
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .244	S= .213	S= .331	S= .413	S= .355	S= .251	S= .149	S= .455	S= .273	S= .336
NCLASS	-.1236	-.1528	-.1655	-.2728	-.1159	-.2160	-.0322	-.1183	-.0781	-.1077
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .110	S= .065	S= .050	S= .003	S= .125	S= .015	S= .375	S= .121	S= .220	S= .143
NEDUC	-.0021	-.1117	-.3113	-.1568	-.2253	-.2989	-.2318	-.2200	-.2536	-.2261
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .492	S= .134	S= .001	S= .060	S= .012	S= .001	S= .010	S= .014	S= .005	S= .012
CRINVEN	.3525	.3809	.2471	.1515	.3915	.3727	.2863	.3840	.3660	.4317
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .001	S= .001	S= .007	S= .066	S= .001	S= .001	S= .002	S= .001	S= .001	S= .001
CHAT	1.0000	.3578	.0972	.0199	-.0221	-.3086	.1943	.0501	.1461	.2280
	(0)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .001	S= .001	S= .168	S= .422	S= .414	S= .001	S= .026	S= .310	S= .074	S= .011
AWKQS	.3578	1.0000	.1755	.3610	.2179	.3482	.1044	.0876	.1095	.3293
	(100)	(0)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .001	S= .001	S= .040	S= .001	S= .015	S= .001	S= .151	S= .193	S= .139	S= .001
ASP	.0972	.1755	1.0000	.0997	.1109	.3375	.3109	.2694	.3320	.1798
	(100)	(100)	(0)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .168	S= .040	S= .001	S= .162	S= .136	S= .001	S= .001	S= .003	S= .001	S= .037

(Table A7 cont.)

	CHAT	AWKQS	ASP	MTOM	MTOC	CTOM	VERBIQ	PERFIQ	FULLIQ	NFERA
MTOM	.0199	.3610	.0997	1.0000	.1081	.1487	.0439	.0514	.0503	.0915
	(100)	(100)	(100)	(0)	(100)	(100)	(100)	(100)	(100)	(100)
	S= .422	S= .001	S= .162	S= .001	S= .142	S= .070	S= .332	S= .306	S= .310	S= .183
MTOC	.0221	.2179	.1109	.1081	1.0000	.3015	.1867	.1108	.1738	.2747
	(100)	(100)	(100)	(100)	(0)	(100)	(100)	(100)	(100)	(100)
	S= .414	S= .015	S= .136	S= .142	S= .001	S= .001	S= .031	S= .136	S= .042	S= .003
CTOM	.3086	.3482	.3375	.1487	.3015	1.0000	.3623	.2921	.3750	.6152
	(100)	(100)	(100)	(100)	(100)	(0)	(100)	(100)	(100)	(100)
	S= .001	S= .001	S= .001	S= .070	S= .001	S= .001	S= .001	S= .002	S= .001	S= .001
VERBIQ	.1943	.1044	.3109	.0439	.1867	.3623	1.0000	.5837	.9208	.4895
	(100)	(100)	(100)	(100)	(100)	(100)	(0)	(100)	(100)	(100)
	S= .026	S= .151	S= .001	S= .332	S= .031	S= .001	S= .001	S= .001	S= .001	S= .001
PERFIQ	.0501	.0876	.2694	.0514	.1108	.2921	.5837	1.0000	.8535	.4650
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(0)	(100)	(100)
	S= .310	S= .193	S= .003	S= .306	S= .136	S= .002	S= .001	S= .001	S= .001	S= .001
FULLIQ	.1461	.1095	.3320	.0503	.1738	.3750	.9208	.8535	1.0000	.5400
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(0)	(100)
	S= .074	S= .139	S= .001	S= .310	S= .042	S= .001	S= .001	S= .001	S= .001	S= .001
NFERA	.2280	.3293	.1798	.0915	.2747	.6152	.4895	.4650	.5400	1.0000
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(0)
	S= .011	S= .001	S= .037	S= .183	S= .003	S= .001	S= .001	S= .001	S= .001	S= .001

(COEFFICIENT / CASES / SIGNIFICANCE) (99.0000 MEANS UNCOMPUTABLE)

SECTION 2: Relationship of Demographic to Child-rearing Variables. (Table A8)

SEX

	CRInven		Chat		AwkQs		
	Mean	SD	Mean	SD	Mean	SD	N
Girls	4.42	1.90	12.9	3.22	19.5	4.12	48
Boys	3.67	2.00	11.6	3.30	17.7	4.35	52
Total	4.03	1.98	12.2	3.31	18.6	4.31	100
F value	3.62		3.72		4.52		1,98 df.
Signif.	.0599		.0565		.0359		

	Asp		MtoM		MtoC		CtoM		
	Low	High	No	Yes	No	Yes	No	Yes	N
Girls	17	31	31	17	36	12	21	27	48
Boys	17	35	36	16	43	9	32	20	52
Total	34	66	67	33	79	21	53	47	100
Corrected χ^2 value	0.006		0.079		0.487		2.497		1 df.
Signif.	.9394		.7788		.4853		.1141		

FAMILY SIZE

	CRInven		Chat		AwkQs		
	Mean	SD	Mean	SD	Mean	SD	N
1 or 2	4.33	1.96	13.0	3.78	19.2	4.22	39
3	3.91	1.73	11.9	2.93	19.0	4.18	32
4 plus	3.76	2.25	11.6	2.92	17.1	4.37	29
Total	4.03	1.98	12.2	3.31	18.5	4.31	100
F value	0.79		1.76		2.40		2,97 df.
Signif.	.4560		.1780		.0963		

	Asp		MtoM		MtoC		CtoM		
	Low	High	No	Yes	No	Yes	No	Yes	N
1 or 2	11	28	27	12	27	12	18	21	39
3	10	22	22	10	27	5	16	16	32
4 plus	13	16	18	11	25	4	19	10	29
Total	34	66	67	33	79	21	53	47	100
χ^2 value	2.207		0.451		3.709		2.673		2 df.
Signif.	.3318		.7981		.1566		.2627		

(Table A8 cont.)

SOCIAL CLASS

	CRInven		Chat		AwkQs		
	Mean	SD	Mean	SD	Mean	SD	N
III NM	4.60	2.55	13.5	3.31	19.0	5.06	10
III M	4.08	1.87	11.9	3.38	18.3	4.51	50
IV & V	4.48	1.95	12.6	3.09	19.0	4.09	27
No male H of H	2.46	1.20	11.8	3.54	18.0	3.67	13
Total	4.03	1.98	12.2	3.31	18.5	4.31	100
F value	3.78		0.78		0.25		3,96 df.
Signif.	.0130		.5054		.8588		

	Asp		MtoM		MtoC		CtoM		
	Low	High	No	Yes	No	Yes	No	Yes	N
III NM	2	8	6	4	8	2	5	5	10
III M	16	34	31	19	36	14	26	24	50
IV & V	10	17	20	7	22	5	14	13	27
No male H of H	6	7	10	3	13	0	8	5	13
Total	34	66	67	33	79	21	53	47	100
χ^2 value	1.929		1.977		5.039		0.451		3 df.
Signif.	.5872		.5772		.1690		.9295		

FAMILY CIRCS.

	CRInven		Chat		AwkQs		
	Mean	SD	Mean	SD	Mean	SD	N
Usual	4.27	1.98	12.3	3.30	18.6	4.44	86
Unusual	2.57	1.22	11.6	3.43	17.9	3.54	14
Total	4.03	1.98	12.2	3.31	18.5	4.31	100
F value	9.63		0.53		0.30		1,98 df.
Signif.	.0025		.4694		.5826		

	Asp		MtoM		MtoC		CtoM		
	Low	High	No	Yes	No	Yes	No	Yes	N
Usual	27	59	56	30	66	20	44	42	86
Unusual	7	7	11	3	13	1	9	5	14
Total	34	66	67	33	79	21	53	47	100
χ^2 value*	1.121		0.471		1.038		0.389		1 df.
Signif.	.2898		.4924		.3083		.5329		

* With Yates' correction

(Table A8 cont.)

MOTHER WORKING

	CRInven		Chat		AwkQs		
	Mean	SD	Mean	SD	Mean	SD	N
Not working	4.09	2.00	12.5	3.65	18.9	3.96	44
Part time	3.79	2.07	12.2	3.15	18.3	4.69	38
Full time	4.39	1.75	11.6	2.81	18.0	4.47	18
Total	4.03	1.98	12.2	3.31	18.5	4.31	100
F value	0.59		0.46		0.35		2,97 df.
Signif.	.5542		.6353		.7070		

	Asp		MtoM		MtoC		CtoM		
	Low	High	No	Yes	No	Yes	No	Yes	N
Not work	16	28	30	14	34	10	25	19	44
Part time	16	22	24	14	30	8	22	16	38
Full time	2	16	13	5	15	3	6	12	18
Total	34	66	67	33	79	21	53	47	100
χ^2 value	5.424		0.504		0.283		3.418		2 df.
Signif.	.0664		.7774		.8681		.1811		

MOTHER'S SOCIAL CLASS

	CRInven		Chat		AwkQs		
	Mean	SD	Mean	SD	Mean	SD	N
Non manual	4.46	2.13	12.9	3.05	19.6	4.48	28
Other	3.86	1.90	12.0	3.39	18.1	4.21	72
Total	4.03	1.98	12.2	3.31	18.5	4.31	100
F value	1.89		1.52		2.34		1,98 df.
Signif.	.1719		.2204		.1290		

	Asp		MtoM		MtoC		CtoM		
	Low	High	No	Yes	No	Yes	No	Yes	N
Non man.	6	22	13	15	20	8	10	18	28
Other	28	44	54	18	59	13	43	29	72
Total	34	66	67	33	79	21	53	47	100
χ^2 value*	2.016		6.207		0.785		3.751		1 df.
Signif.	.1556		.0127		.3757		.0528		

* With Yates' correction

(Table A8 cont.)

MOTHER'S EDUCATION

	CRInven		Chat		AwkQs		
	Mean	SD	Mean	SD	Mean	SD	N
Regrets	4.41	2.00	12.2	3.45	19.2	3.90	32
No regrets	3.85	1.96	12.2	3.27	18.2	4.48	68
Total	4.03	1.98	12.2	3.31	18.5	4.31	100
F value	1.72		0.00		1.24		1,98 df.
Signif.	.1932		.9836		.2685		

	Asp		MtoM		MtoC		CtoM		
	Low	High	No	Yes	No	Yes	No	Yes	N
Regrets	4	28	18	14	21	11	10	22	32
No regrets	30	38	49	19	58	10	43	25	68
Total	34	66	67	33	79	21	53	47	100
χ^2 value*	8.336		1.797		3.958		7.699		1 df.
Signif.	.0039		.1801		.0467		.0055		

* With Yates' correction

SCHOOL

	CRInven		Chat		AwkQs		
	Mean	SD	Mean	SD	Mean	SD	N
V	4.46	2.55	12.2	4.32	17.9	4.08	24
T	3.77	2.08	12.2	3.12	17.2	4.89	26
S	4.20	1.50	12.4	2.43	20.2	3.38	25
P	3.72	1.65	12.1	3.33	18.8	4.39	25
Total	4.03	1.98	12.2	3.31	18.5	4.31	100
F value	0.79		0.04		2.35		3,96 df.
Signif.	.5036		.9882		.0777		

	Asp		MtoM		MtoC		CtoM		
	Low	High	No	Yes	No	Yes	No	Yes	N
V	11	13	14	10	16	8	13	11	24
T	9	17	18	8	20	6	18	8	26
S	6	19	16	9	22	3	11	14	25
P	8	17	19	6	21	4	11	14	25
Total	34	66	67	33	79	21	53	47	100
χ^2 value	2.661		1.891		3.865		4.389		3 df.
Signif.	.4470		.5952		.2764		.2224		

SECTION 3: Inter-relationships amongst Child-rearing variables.
(Table A9)

ASPIRATIONS

	CRInven		Chat		AwkQs		
	Mean	SD	Mean	SD	Mean	SD	N
High	4.38	1.99	12.5	3.37	19.1	3.95	66
Low	3.35	1.79	11.8	3.19	17.5	4.84	34
Total	4.03	1.98	12.2	3.31	18.5	4.31	100
F value	6.37		0.93		3.12		1,98 df.
Signif.	.0132		.3361		.0806		

	MtoM		MtoC		CtoM		
	No	Yes	No	Yes	No	Yes	N
High	42	24	50	16	27	39	66
Low	25	9	29	5	26	8	34
Total	67	33	79	21	53	47	100
χ^2 value*	0.596		0.722		10.009		1 df.
Signif.	.4400		.3953		.0016		

*With Yates' correction

MOTHER'S OWN READING (MtoM)

	CRInven		Chat		AwkQs		
	Mean	SD	Mean	SD	Mean	SD	N
Yes	4.45	2.25	12.3	2.93	20.7	3.62	33
No	3.82	1.81	12.2	3.50	17.4	4.23	67
Total	4.03	1.98	12.2	3.31	18.5	4.31	100
F value	2.30		0.04		14.69		1,98 df.
Signif.	.1325		.8443		.0002		

	MtoC		CtoM		
	No	Yes	No	Yes	N
Yes	24	9	14	19	33
No	55	12	39	28	67
Total	79	21	53	47	100
χ^2 value*	0.672		1.623		1 df.
Signif.	.4124		.2026		

*With Yates' correction

(Table A9 cont.)

MOTHER READS TO CHILD (MtoC)

	CRInven		Chat		AwkQs		
	Mean	SD	Mean	SD	Mean	SD	N
Yes	5.52	1.99	12.4	4.04	20.3	3.35	21
No	3.63	1.78	12.2	3.11	18.0	4.43	79
Total	4.03	1.98	12.2	3.31	18.5	4.31	100
F value	17.74		0.05		4.88		1,98 df.
Signif.	.0001		.8275		.0294		

CHILD READS TO MOTHER (CtoM)

	CRInven		Chat		AwkQs		
	Mean	SD	Mean	SD	Mean	SD	N
Yes	4.81	1.93	13.3	2.80	20.1	3.36	47
No	3.34	1.76	11.3	3.46	17.1	4.60	53
Total	4.03	1.98	12.2	3.31	18.5	4.31	100
F value	15.81		10.32		13.52		1,98 df.
Signif.	.0001		.0018		.0004		

APPENDIX 7

REGRESSION ANALYSES

This appendix is divided into four sections, containing:

(1) The output from the regression analysis run which yielded the equation,

$$\hat{y} = (9.78 \times \text{CtoM}) + (3.73 \times \text{Asp}) + 88.13$$

from a predictor pool containing only child-rearing variables.

(2) The output from the analysis which yielded the Model I equation. On this occasion, 'created' variables had been added to the predictor pool, in order to squeeze the maximal amount of predictive power out of the information available.
The analysis of residuals from the Model I equation is reported at the end of this section.

(3) The output from the analysis which yielded the Model II equation, from a predictor pool which included demographic as well as child-rearing information.
At the end of this section, the analysis of residuals from the Model II equation is reported.

(4) The output from the Model III analysis, in which the predictor pool included child-rearing, demographic, and IQ information.
Finally, the analysis of Model III residuals is reported.

SECTION 1

MULTIPLE REGRESSION

Table A10.

Dependent variable: NFER 'A'

Predictor pool: Asp,CRInven, Chat, AwkQs, CtoM, MtoC, MtoM

Variable entered on step number 1: CtoM

Multiple R	0.55517	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R Square	0.30821	Regression	1	2009.82099	2009.82099	25.84055
		Residual	58	4511.11235	77.77780	
Standard error	8.81917					

---------- Variables in the equation ----------

VARIABLE	B	BETA	STD ERROR B	F
CtoM	11.58176	0.55517	2.27837	25.841
(Constant)	89.93548			

---------- Variables not in the equation ----------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
CRInven	0.11297	0.13011	0.91760	0.982
Chat	0.05946	0.06763	0.89513	0.262
AwkQs	0.08189	0.09402	0.91194	0.508
Asp	0.16126	0.16391	0.71470	1.574
MtoM	-0.03165	-0.03702	0.94642	0.078
MtoC	0.09737	0.11320	0.93499	0.740

* * * *

---------- Variables not in the equation ----------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
AwkQs	0.07053	0.08180	0.90566	0.377
MtoM	-0.03374	-0.04000	0.94621	0.090
MtoC	0.07789	0.09074	0.91374	0.465

* * * *

SECTION 2

MULTIPLE REGRESSION - MODEL I

Table All.

Dependent variable: NFER 'A'

Predictor pool: Asp, CRInven, Chat, AwkQs, CtoM, MtoC, plus the following created variables, CtoM x CRInven (IntA), CtoM x Chat (IntB), CtoM x AwkQs (IntC), Asp x CRInven (IntD), Asp x Chat (IntE), Asp x AwkQs (IntF), MtoC x CRInven (IntG), MtoC x Chat (IntH), MtoC x AwkQs (IntI).

Variable entered on step number 1: IntC

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
Multiple R	0.58558					
R Square	0.34291	Regression	1	2236.08140	2236.08140	30.26773
		Residual	58	4284.85193	73.87676	
Standard error	8.59516					

Variables in the equation

VARIABLE	B	BETA	STD ERROR B	F
IntC	0.58071	0.58558	0.10555	30.268
(Constant)	89.75527			

Variables not in the equation

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
CRInven	0.08036	0.09370	0.89335	0.505
Chat	0.02399	0.02759	0.86873	0.043
AwkQs	0.00445	0.00503	0.83800	0.001
Asp	0.14209	0.14883	0.72093	1.291
MtoC	0.08543	0.10173	0.93174	0.596
CtoM	-0.42170	-0.10710	0.04238	0.661
IntA	-0.05150	-0.02951	0.21573	0.050
IntB	0.11929	0.03643	0.06129	0.076
IntD	0.12853	0.13440	0.71848	1.048
IntE	0.11295	0.11323	0.66035	0.740
IntF	0.15332	0.14901	0.62066	1.294
IntG	0.03138	0.03646	0.88711	0.076
IntH	0.05396	0.06284	0.89121	0.226
IntI	0.08395	0.09930	0.91942	0.568

* * * *

Variable entered on step number 2: IntF

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
Multiple R	0.59791	Regression	2	2331.21913	1165.60957	15.85782
R Square	0.35750	Residual	57	4189.71420	73.50376	
Standard error	8.57343					

---------- Variables in the equation ----------

VARIABLE	B	BETA	STD ERROR	F
IntC	0.48707	0.49115	0.13364	13.283
IntF	0.16860	0.15332	0.14820	1.294
(Constant)	88.27880			

---------- Variables not in the equation ----------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
CRInven	0.04651	0.05237	0.81454	0.154
Chat	0.01469	0.01704	0.86418	0.016
AwkQs	-0.03717	-0.04061	0.76679	0.092
Asp	0.07248	0.02825	0.09761	0.045
MtoC	0.06364	0.07520	0.89701	0.318
CtoM	-0.33476	-0.08482	0.04125	0.406
IntA	-0.06244	-0.03615	0.21536	0.073
IntB	0.19102	0.05842	0.06010	0.192
IntD	0.04915	0.03425	0.31198	0.066
IntE	-0.03457	-0.01946	0.20364	0.021
IntG	0.00257	0.00294	0.84193	0.000
IntH	0.03375	0.03921	0.86690	0.086
IntI	0.05856	0.06825	0.87281	0.262

* * * *

Analysis of Residuals from the Model I Equation.

A histogram of the unstandardised residuals from the Model I equation,

$$\hat{y} = (0.49 \times \text{IntC}) + (0.17 \times \text{IntF}) + 88.28$$

was given in the text (Figure 56). Following the advice of Draper and Smith (1966), the residuals were next plotted against estimated y (Fig.A4).

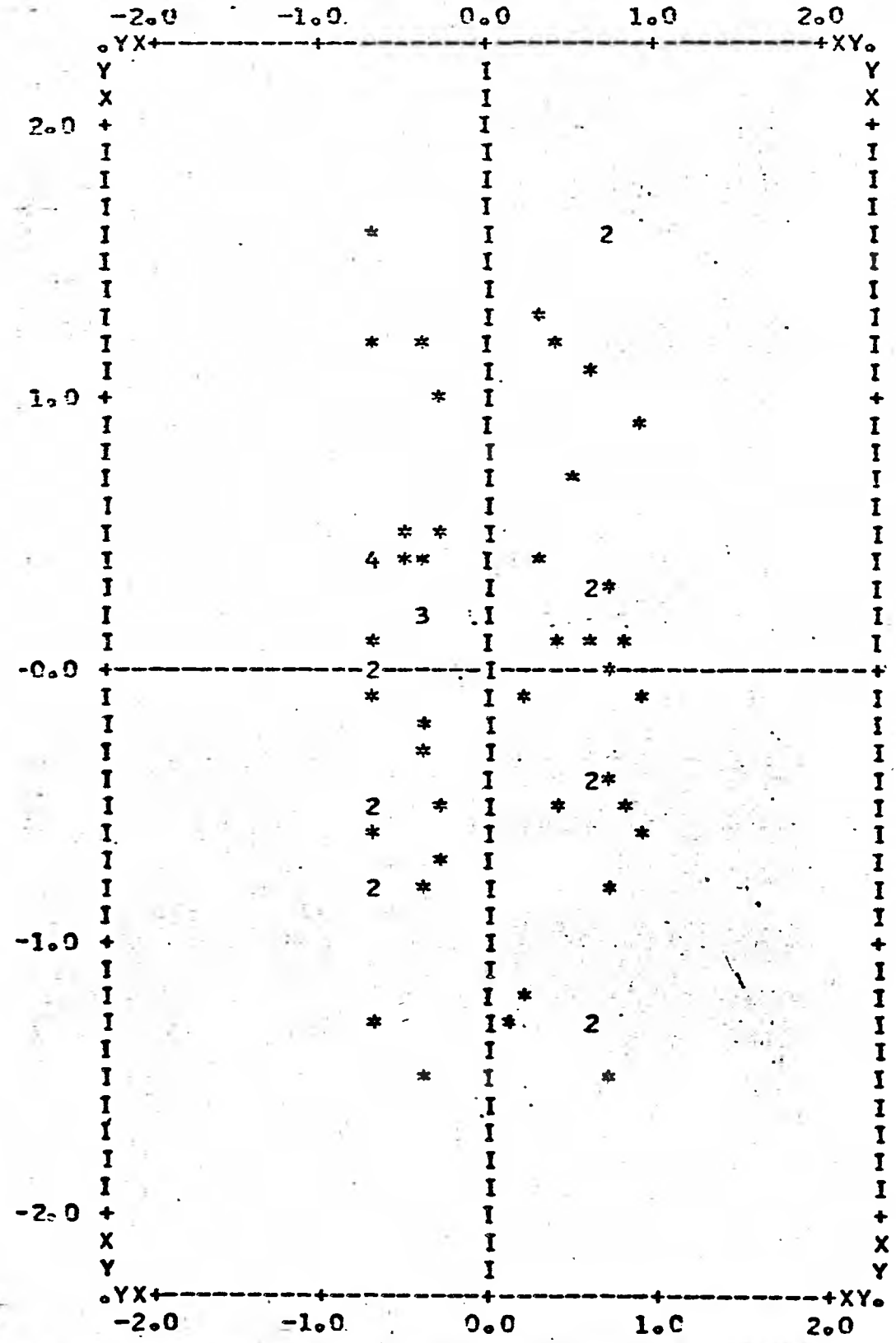

Figure A4 . Plot of standardised residual (down) against predicted standardised dependent variable (across) for Model I equation.

As explained in the text, these two plots were drawn up and inspected in order to check for violations of the assumptions underlying the regression analysis model. In brief, the model assumes that the errors of prediction, ie, the residuals, are (a) independent, (b) have zero mean, (c) a constant variance, and (d) follow a normal distribution.

The histogram of unstandardised residuals (Figure 56) yielded no evidence of violations of assumptions (b) or (d). The scatterplot (Figure A 4) likewise provided no evidence of major variance fluctuations, and no evidence either of systematic error (in that departures from the fitted equation did not appear to be a function of estimated y).

As a further check on assumptions (a) and (c), plots were also drawn up of the residuals against IntC and IntF, the predictors from the equation: no evidence of violation of either assumption was found.

Finally, the residuals were plotted against a number of potential predictors. The reasoning behind this procedure is that the appearance of a pattern in this type of residual plot is evidence that access to the information represented by the new variable would improve prediction efficiency. Plots against the demographic variables sex, class, mother working, mother's education, family size, family circumstances, and school were drawn up and examined for signs of systematic bias. A social class effect was apparent, and there was also a suggestion of a school effect, but the distribution of residuals appeared to be unrelated to category membership on any of the other variables. The class and school plots are given in the text, Figure 57. The stratified histogram of residuals against the sex variable is also given in Figure 57, as an example of a plot showing no sign of between-group differences in the distribution

of residuals; the plots against the remaining demographic variables yielded similar negative evidence.

When the Model II equation was constructed, using a predictor pool which included demographic as well as child-rearing variables, a significant 'Class' contribution was found (and non-significant contributions of all the other new predictors), as the analysis of Model I residuals had anticipated.

The Model II analysis is described on the pages to follow.

SECTION 3

MULTIPLE REGRESSION - MODEL II

Table A12.

Dependent variable: NFER 'A'

Predictor pool: Asp, CtoM, MtoC, Class, Sex, Circs,TotalN, Nolder, Nyounger, Meduc, plus the following created variables, CtoM x CRInven (IntA), CtoM x Chat (IntB), CtoM x AwkQs (IntC), Asp x CRInven (IntD), Asp x Chat (IntE), Asp x AwkQs (IntF), MtoC x CRInven (IntG), MtoC x Chat (IntH), MtoC x AwkQs (IntI).

Variable entered on step number 1: IntC

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
Multiple R	0.58558					
R Square	0.34291	Regression	1	2236.08140	2236.08140	30.26773
		Residual	58	4284.85193	73.87676	
Standard error	8.59516					

---------- Variables in the equation ----------

VARIABLE	B	BETA	STD ERROR B	F
IntC	0.58071	0.58558	0.10555	30.268
(Constant)	89.75527			

---------- Variables not in the equation ----------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
Sex	-0.00216	-0.00262	0.97336	0.000
Class	-0.19444	-0.23958	0.99758	3.471
Circs	0.05557	0.06803	0.98484	0.265
TotalN	-0.00478	-0.00586	0.98475	0.002
Nolder	-0.05016	-0.06137	0.98356	0.215
Nyounger	0.07058	0.08706	0.99975	0.435
Meduc	-0.01875	-0.02192	0.89807	0.027
Asp	0.14209	0.14883	0.72093	1.291
MtoC	0.08543	0.10173	0.93174	0.596
CtoM	-0.42170	-0.10710	0.04238	0.661
IntA	-0.05150	0.02951	0.21573	0.050
IntB	0.11929	0.03643	0.06129	0.076
IntD	0.12853	0.13440	0.71848	1.048
IntE	0.11295	0.11323	0.66035	0.740
IntF	0.15332	0.14901	0.62066	1.294
IntG	0.03138	0.03646	0.88711	0.076
IntH	0.05396	0.06284	0.89121	0.226
IntI	0.08395	0.09930	0.91942	0.568

* *

Variable entered on step number 2: Class

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
Multiple R	0.61695	Regression	2	2482.03034	1241.01517	17.51413
R Square	0.38063	Residual	57	4038.90300	70.85795	
Standard error	8.41772					

Variables in the equation

VARIABLE	B	BETA	STD ERROR B	F
IntC	0.57123	0.57603	0.10350	30.462
Class	-6.75695	-0.19444	3.62679	3.471
(Constant)	102.68777			

Variables not in the equation

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
Sex	-0.00154	-0.00193	0.97335	0.000
Circs	0.07982	0.09994	0.97108	0.565
TotalN	0.00289	0.00365	0.98323	0.001
Nolder	-0.05141	-0.06478	0.98352	0.236
Nyounger	0.08428	0.10682	0.99506	0.646
Meduc	-0.05106	-0.06077	0.87734	0.208
Asp	0.12646	0.13608	0.71728	1.057
MtoC	0.09953	0.12179	0.92746	0.843
CtoM	-0.26048	-0.06703	0.04101	0.253
IntA	-0.11065	-0.06469	0.21171	0.235
IntB	0.14359	0.04515	0.06123	0.114
IntD	0.07834	0.08194	0.67762	0.379
IntE	0.08185	0.08372	0.64804	0.395
IntF	0.12064	0.11953	0.60805	0.812
IntG	0.03454	0.04133	0.88690	0.096
IntH	0.06845	0.08191	0.88698	0.378
IntI	0.09511	0.11571	0.91676	0.760

* * * *

---------- Variables in the equation ----------

VARIABLE	B	BETA	STD ERROR B	F
IntC	0.50536	0.50960	0.12169	17.246
Class	-6.49116	-0.18679	3.63420	3.190
Asp	2.92558	0.12646	2.84611	1.057
(Constant)	100.74156			

---------- Variables not in the equation ----------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
Sex	-0.02092	-0.02608	0.94428	0.037
Circs	0.09339	0.11727	0.95851	0.767
TotalN	0.03863	0.04689	0.89537	0.121
Nolder	-0.01041	-0.01217	0.83035	0.008
Nyounger	0.06797	0.08570	0.96623	0.407
Meduc	-0.04146	-0.04962	0.87074	0.136
MtoC	0.08443	0.10305	0.90554	0.590
CtoM	-0.32449	-0.08374	0.04049	0.388
IntA	-0.12351	-0.07278	0.21110	0.293
IntB	0.16036	0.05086	0.06114	0.143
IntD	-0.03408	-0.02474	0.32046	0.034
IntE	-0.11790	-0.06325	0.17494	0.221
IntF	-0.05525	-0.02009	0.08039	0.022
IntG	0.01685	0.02009	0.86440	0.022
IntH	0.05456	0.06535	0.87194	0.236
IntI	0.07938	0.09625	0.89375	0.514

* * * *

Analysis of Residuals from the Model II Equation

A histogram of the unstandardised residuals from the Model II equation,

$$\hat{y} = (0.51 \times \text{IntC}) - (6.49 \times \text{Class}) + (2.93 \times \text{Asp}) + 100.74$$

is given in Figure A 5 , and a plot of standardised residuals against estimated y in Figure A 6 . Inspection of these two plots revealed no violation of basic regression assumptions. Plots of the residuals against the independent variables IntC, Class and Asp from the equation were also drawn up, and again no anomalies were apparent.

Figure A5 . Histogram of unstandardised residuals from the Model II equation.

At this stage in the regression analysis of the data, the predictor pool had included no IQ information. To get a preliminary idea of whether or not access to such information would improve prediction of reading attainment, the residuals from Model II were plotted against Verbal IQ. Although a clear pattern of association did not emerge from visual inspection of the scattergram, a significant correlation of +0.26 was found between the two variables, indicating that prediction could indeed be improved by access to IQ information. The Model III analysis, next to be described, demonstrated that this indication was correct.

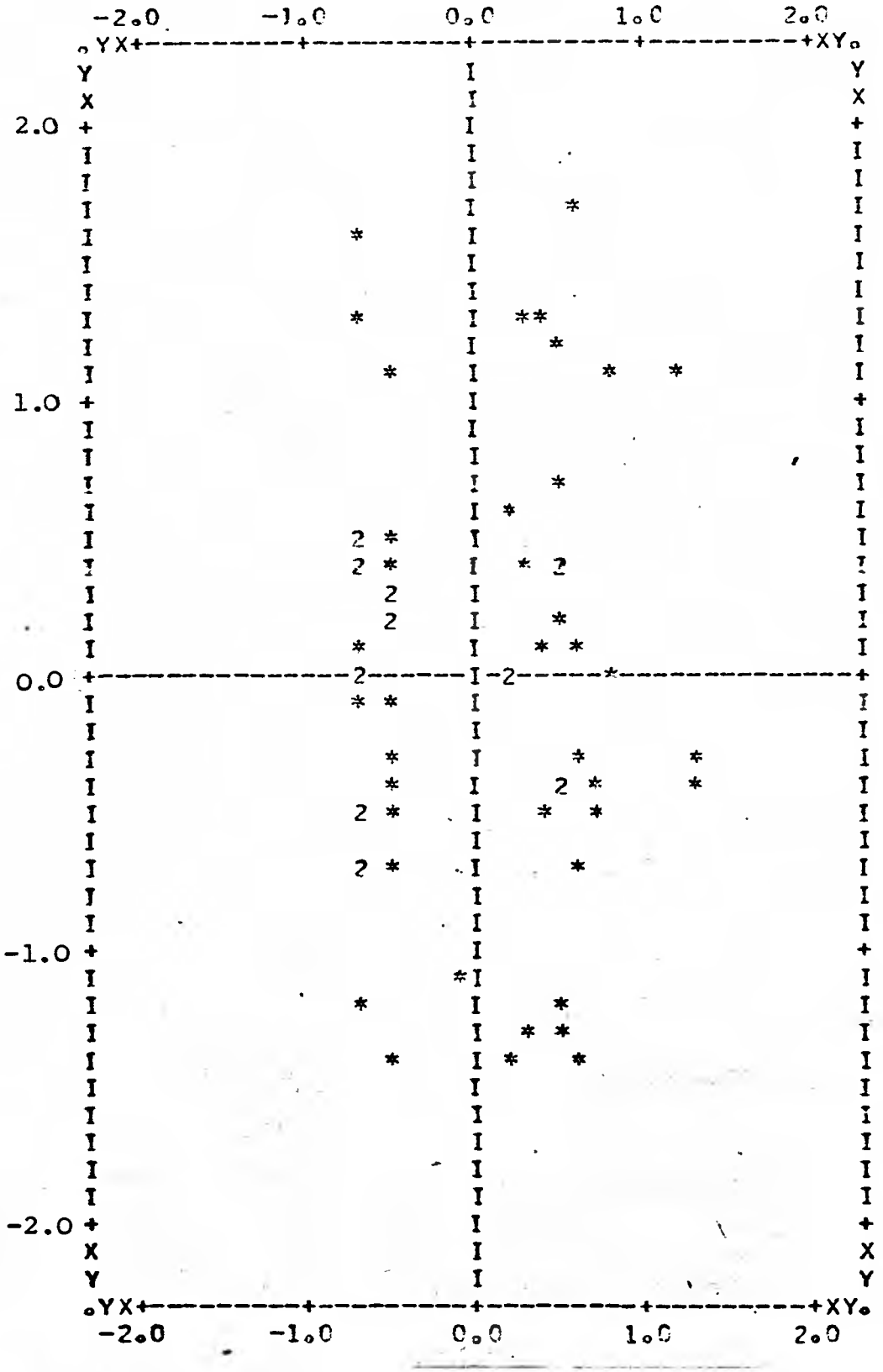

Figure A6 . Plot of standardised residual (down) against predicted standardised dependent variable (across) for Model II equation.

SECTION 4

MULTIPLE REGRESSION - MODEL III

Table A13.

Dependent variable: NFER 'A'

Predictor pool: Asp, CtoM, Class, TotalN, Nolder, Meduc, VerbIQ, PerfIQ, FullIQ, plus the following created variables, CtoM x CRInven (IntA), CtoM x Chat (IntB), CtoM x AwkQs (IntC), Asp x CRInven (IntD), Asp x Chat (IntE), Asp x AwkQs (IntF), CtoM x VerbIQ (IntM), Asp x VerbIQ (IntN), CtoM x PerfIQ (IntP), Asp x PerfIQ (IntQ), CtoM x FullIQ (IntR), Asp x FullIQ (IntS).

Variable entered on step number 1: IntM

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
Multiple R	0.61703					
R Square	0.38073	Regression	1	2482.72320	2482.72320	35.65885
		Residual	58	4038.21014	69.62431	
Standard error	8.34412					

Variables in the equation

VARIABLE	B	BETA	STD ERROR B	F
IntM	0.11587	0.61703	0.01940	35.659
(Constant)	89.45618			

Variables not in the equation

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
Class	-0.18739	-0.23773	0.99660	3.414
TotalN	-0.02608	-0.03302	0.99313	0.062
Nolder	-0.10253	-0.13021	0.99873	0.983
Meduc	-0.02224	-0.02698	0.91154	0.042
Asp	0.12324	0.13357	0.72744	1.035
CtoM	-1.03529	-0.28190	0.04591	4.921
VerbIQ	0.17381	0.19304	0.76388	2.206
PerfIQ	0.15890	0.19184	0.90260	2.178
FullIQ	0.21329	0.23666	0.76241	3.382
IntA	-0.08144	-0.05326	0.26487	0.162
IntB	-0.20142	-0.07330	0.08202	0.308
IntC	-0.05917	-0.02179	0.08399	0.027
IntD	0.12656	0.13936	0.75080	1.129
IntE	0.09793	0.10258	0.67950	0.606
IntF	0.15779	0.16550	0.68133	1.605

---------- Variables not in the equation ----------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
IntN	0.19928	0.20233	0.63838	2.433
IntP	-0.40052	-0.09970	0.03837	0.572
IntQ	0.15534	0.16523	0.70061	1.600
IntR	-0.45532	-0.05172	0.00799	0.153
IntS	0.18561	0.19123	0.65728	2.163

* * * *

The program continued to add variables to the equation, step by step. After step 8, presented below, no further variable made a significant contribution to prediction.

* *

Variable entered on step number 8: TotalN

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
Multiple R	0.73983					
R Square	0.54735	Regression	8	3569.26293	446.15787	7.70887
Standard error	7.60762	Residual	51	2951.67040	57.87589	

---------- Variables in the equation ----------

VARIABLE	B	BETA	STD ERROR B	F
IntM	0.27501	1.46454	0.10243	7.209
CtoM	-57.31847	-2.74754	17.10248	11.232
IntC	0.74732	0.75359	0.47783	2.446
Nolder	-2.27171	-0.30988	1.20789	3.537
IntP	0.20998	1.09207	0.13104	2.568
Class	-4.95877	-0.14270	3.48505	2.025
Meduc	-2.87108	-0.13136	2.28607	1.577
TotalN	1.33111	0.17366	1.23763	1.157
(Constant)	106.55067			

---------- Variables not in the equation ----------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
Asp	0.03859	0.04325	0.56851	0.094
VerbIQ	-0.04750	-0.03932	0.31010	0.077
PerfIQ	0.04071	0.03824	0.39930	0.073
FullIQ	-0.00267	-0.00222	0.31273	0.000
IntA	0.02920	0.01887	0.18907	0.018
IntB	-0.19778	-0.06212	0.04466	0.194
IntD	0.04144	0.04984	0.65462	0.124
IntE	-0.04954	-0.05344	0.52689	0.143
IntF	0.00211	0.00215	0.47316	0.000
IntN	0.03530	0.03714	0.50105	0.069
IntQ	0.02500	0.02694	0.52553	0.036
IntR	-4.04570	-0.03195	0.00003	0.051
IntS	0.02962	0.03141	0.50894	0.049

* *

SUMMARY TABLE

(significant contributions only)

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
IntM	0.61703	0.38073	0.38073	0.61703	0.27501	1.46454
CtoM	0.65570	0.42994	0.04921	0.55517	-57.31847	-2.74754
IntC	0.68432	0.46829	0.03835	0.58558	0.74732	0.75359
Nolder	0.70502	0.49705	0.02876	-0.12441	-2.27171	-0.30988
IntP	0.71715	0.51431	0.01725	0.58971	0.20998	1.09207
Class	0.72591	0.52695	0.01265	-0.22275	-4.95877	-0.14270
Meduc	0.73286	0.53709	0.01014	-0.20379	-2.87108	-0.13136
TotalN	0.73983	0.54735	0.01027	-0.07703	1.33111	0.17366
(Constant)					106.55067	

* * * *

Analysis of Residuals from the Model III Equation

A histogram of the unstandardised residuals from the Model III equation,

$$\hat{y} = (0.27 \times \text{IntM}) - (57.32 \times \text{CtoM}) + (0.75 \times \text{IntC}) - (2.27 \times \text{Nolder}) + (0.21 \times \text{IntP}) - (4.96 \times \text{Class}) - (2.87 \times \text{Meduc}) + (1.33 \times \text{TotalN}) + 106.55$$

is given in Figure A 7 , and a scattergram of standardised residuals against estimated y in Figure A 8 . As previously, inspection of these two types of plot revealed no violation of basic regression assumptions. Plots of the residuals against all the predictor variables from the equation were also constructed: again, no anomalies were apparent. Finally, the residuals were plotted against'School'; no pattern was discernible. The examination of the residuals was terminated at this point.

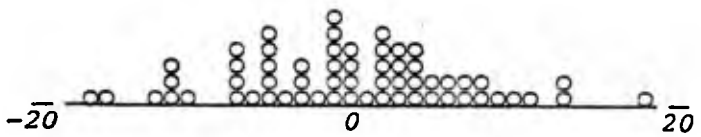

Figure A 7. Histogram of unstandardised residuals from the Model III equation.

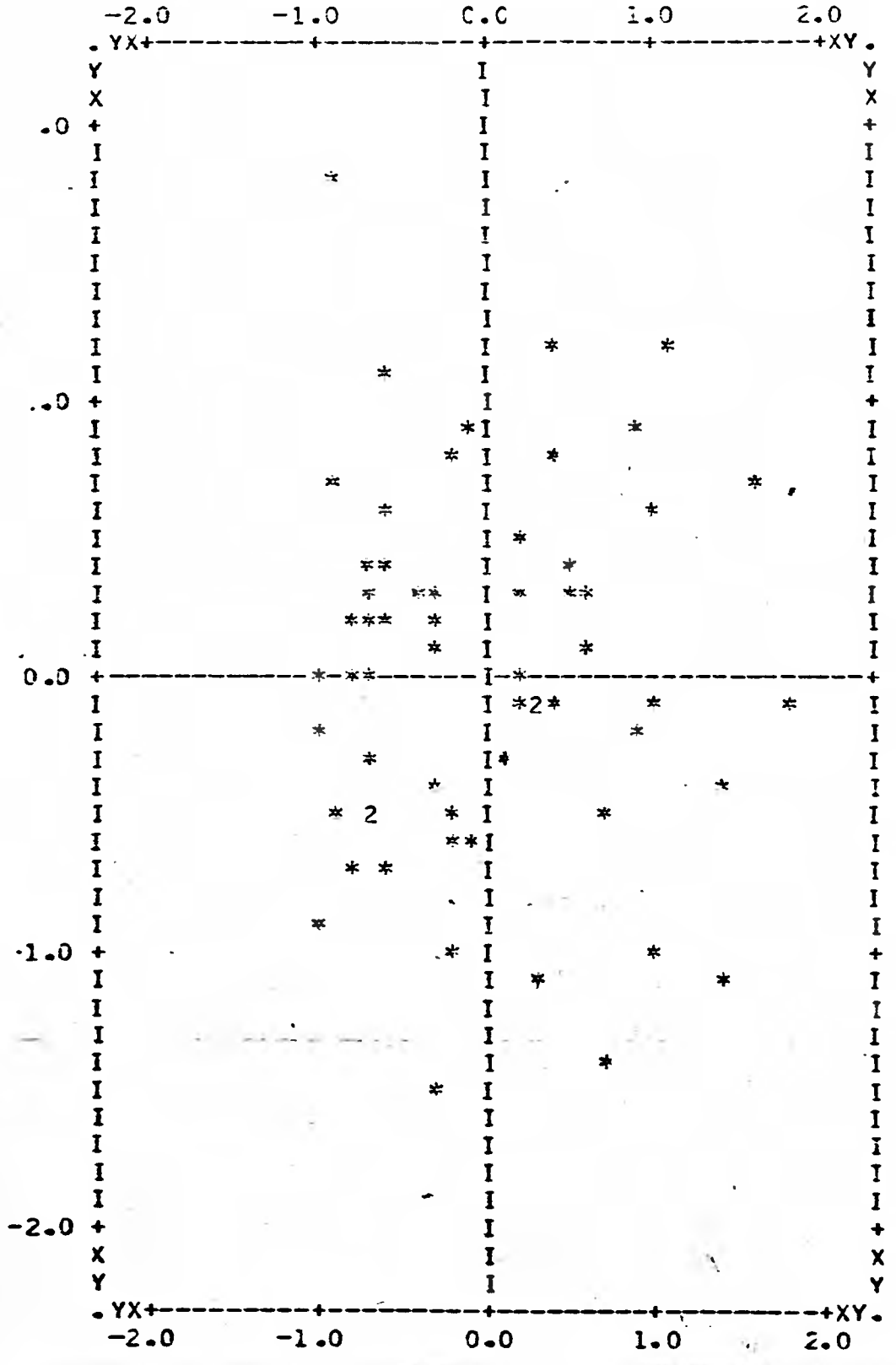

Figure A8. Plot of standardised residual (down) against predicted standardised dependent variable (across) for Model III equation.

APPENDIX 8

INTERVIEW SCHEDULE FOR THE SECOND JUNIOR SCHOOL STUDY

Notes

(a) Items 1 and 2 are introductory questions only, and responses to them were not analysed.

(b) The information from items 3-8 was pooled and used as described in the text (pages 404-405), to form three categories: regular and occasional help in the infants, and no help in the infants

(c) Similarly, information from items 9-11 was pooled and used to classify the amount of help children were given in the juniors. The final classification of 'help given' took account of both infant and junior school practices. This procedure was described in the text, pages 404-8.

(d) An additional response category was found to be necessary for Question 12, to represent the views of mothers who were only in favour of children being given reading to do at home if they were falling behind. (See page 408.)

(e) The coding of responses to Question 14 differed substantially from that originally intended, with two of the original categories being merged (Neutral and In favour), and the third original category being expanded. (Against ita was subdivided according to the nature of the mother's objections; parents do not understand ita, and so cannot help their children; using ita means learning twice; just against new methods.)
An explanation, and further details of these changes, are given in the text, page 408. The final measure of 'mother's attitude to ita' was based on the pooled information from Question 13 and 14.

(f) The last two pages of the questionnaire booklet were occupied by the Bernstein scales. In terms of introductory remarks, layout and all other aspects of presentation, this part of the questionnaire followed the procedures used in the first junior school study exactly. Copies of these two pages are therefore not given in this Appendix, as they have already been presented in Appendix 4.

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SCHOOL.....

DATE .....

Are you Mrs. X, N's mother?

Could you give me N's full name please

Code BOY/GIRL

Does N have any brothers and sisters? Could you give me their names and ages please.

Sex.....

Age.....

And N's father - would you describe his present occupation please.

At end of this section, code Circs: Typical / Atypical

INFANTS SCHOOL

1. If we could begin by thinking about when N first started school, did he need a lot of encouragement from you, or did he seem to take to it alright?

Spontaneous 'loves school' _____

No trouble _____

Trouble _____

2. How about the work side of things - did he need a lot of encouragement when he first started to learn to read, or did he take to it alright? (Prompt if nec. - rainy days or winter evenings.)

Enc. given by M or other _____

Rainy days _____

None given _____

3. Do you remember what used to happen - I mean, did he bring his book home from school at all?

Yes _____

No _____

If Yes to 3

4. And what happened then - did he read it to you at all, or did he get on on his own?

Read to M _____

Got on on his own _____

If Yes to 3

5. About how often did he bring his book home on average - do you remember? (Prompt if necessary.)

Almost every night _____

More than once a week _____

About once a week on average _____

Less than that _____

If appropriate

6. Did he always read it to you then - or just sometimes?

Always _____

Most times _____

Just sometimes _____

Rarely (or never) _____

7. Did he ever read anything to you apart from his schoolbook (or had he had enough by then?)

Yes, other things _____

Nothing _____

If Yes to 7

8. About how often did he do that?

Regularly
((Probe how often) _____

Once in a while _____

JUNIOR SCHOOL

9. Thinking about his school reading book again, how about now - does he still/ever bring his book home?

Regularly still _____
(Probe how often)

Once in a while _____

Not any longer _____

Does now, didn't before _____
(Probe how often)

Still no _____

If book comes home

10. Do you ever/still listen now and again, or does he get on on his own now/still?

Listen regularly _____
(Probe how often)

Every time book comes home _____
(Probe how often)

Once in a while _____

Gets on on own _____

11. Do you give any other sort of help nowadays - library books, that sort of thing? I mean, do you sit and listen, or does he get on on his own? (Prompt) Do you just help with odd words maybe?

Listen regularly _____
(Probe what & how often)

Used to help - child prefers to read on own now. _____
(Probe same for school book?)

Help now and again _____
(Probe what & how often

No other help _____

12. Speaking more generally now, do you think it is/ would be a good thing for children of N's age to be given reading to do at home?

Yes - approve _____

No objection _____

Disapprove _____

13. Last couple of questions about reading now. I don't know about the school round there, but in some schools, they use new methods of teaching reading and maths and so on - especially reading. Have you come across any new ways of teaching reading at all?
(If Yes, probe for details.)

Some knowledge of ita _____

Has heard of new methods but no knowledge of ita _____

Never thought or heard about new methods _____

If has heard of ita

14. How would you feel if they started using ita in a school your child was going to?

Against it _____

Neutral _____

In favour _____

APPENDIX 9

THE SCHOOLS' QUESTIONNAIRE

This appendix contains:

(a) Copies of the infants and junior school questionnaires, together with the information they provided. All items except numbers 10 and 11 were based on questions asked in the survey carried out for the Bullock Report (D.E.S.75.) Coding categories were taken from this source also. The practices of each school are indicated by the appearance of the school's code letter - V, T, S or P - in the boxes beside the relevant response categories.

(b) A summary of the most important similarities and differences between the schools' reported practices. Since the information from the Schools' Questionnaire was only required for simple descriptive purposes, processing of the data was not carried beyond this point.

University of London Institute of Education

Thomas Coram Research Unit — Infants' School Questionnaire

Reading Survey 1974-75: The following questions about the teaching of reading in the school refer to the experiences of the children who were final-year infants in the year 1974-75. If any practice has changed since then, please try to recall the previous method, and answer the questions with reference to the experience of that year-group of children at that stage in their infants' career.

Please tick as appropriate - more than once per question if necessary

1. Were any of the following used by the school in the teaching of reading?

(a)	Initial Teaching alphabet	
(b)	Colour coded schemes	
(c)	Diacritical marking	
(d)	Key words reading scheme (e.g. Ladybird)	*T*
(e)	Other controlled vocabularly (e.g. Janet & John)	*V T S P*
(f)	Breakthrough to Literacy	*V P*
(g)	Reading laboratories	

2. Were any of the following approaches used? (If more than one, please tick as many as necessary, but indicate the main method, if any.)

(a)	Alphabetic analysis (letter names)	*S P*
(b)	Look and Say (word recognition)	*V T S P*
(c)	Phonic 1 (letter sounds, diphthongs)	*V*T S*P*
(d)	Phonic 2 (based on syllables)	*V T S*
(e)	Sentence method	*V S*

3. Graded reading schemes. Does reading practice rely on:

(a)	One single, commercially produced, graded reading scheme.	*S*
(b)	A mixture of books arranged in order by the school and drawing from more than one commercially produced scheme and/or books not in set schemes.	*V T P*

4. Are the children expected to read from their reading scheme books:

(a)	Daily	*V S*
(b)	3 or 4 times weekly	*T P*
(c)	1 or 2 times weekly	
(d)	Less often	

5. Is it usual for the children to read supplementary readers between the major steps of the graded series?

(a)	Yes	*T S P*
(b)	No	*V*

6. Are the children usually tested by the teacher before they move from one book to the next?

(a)	Yes	*V T S P*
(b)	No	

7. Do some poor readers ever have to repeat a book?

(a)	More than once	
(b)	Once	*V T S P*
(c)	Never	

8. May children borrow, for their individual use in school, books from collections:

(a)	In the classroom	*V T S*
(b)	Elsewhere in the school (library etc.)	*V T S P*

9. Are children allowed to take any books for use at home?

(a)	Reading scheme book	*T S P*
(b)	Supplementary reader	*T S P*
(c)	School library books	*V T P*

10. If other than school library book to (9) above, how often are books allowed to be taken home?

(a)	As often as child wishes	*S P*
(b)	More than once a week	
(c)	About once a week	*T*
(d)	Occasionally only, e.g., when moving up a book in a graded scheme.	

11. Are parents encouraged:

(a)	To read to their children	*V T S P*
(b)	To listen to their children read	*T S P*
(c)	Not to try to help their children at home, in case it confuses them	

12. In a typical school day, how much time would a child usually spend on individual reading, excluding reading practice?

(a)	0 minutes	
(b)	5-10 minutes	*V ? S*
(c)	10-20 minutes	*? S*
(d)	More than 20 minutes (Estimate?)	*? P*

13. In a typical school day, how much time would a child usually spend on Reading Practice (graded and supplementary readers, phonic practice etc.)

(a)	0 minutes	
(b)	5-10 minutes	*?*
(c)	10-20 minutes	*V ? P*
(d)	More than 20 minutes (Estimate?)	*? S*

14. In the last term of infants, were any children receiving special help in reading?

(a)	Yes	*V*	*T*	*P*
(b)	No		*S*	

15. If 'Yes' to (14) above, what form does this special help take?

(a)	Extra time from class teacher			
	- individually		*T*	*P*
	- in groups		*T*	
(b)	Part time help from remedial teacher			
	- individually			
	- in groups	*V*		
(c)	Poorest readers put together in one class - i.e. a modified form of streaming			

University of London Institute of Education

Thomas Coram Research Unit — Junior School Questionnaire

Reading Survey 1974-75: The following questions about the teaching of reading in the school refer to the experiences of children who are first year juniors at the present time:

Please tick as appropriate - more than once per question, if necessary.

1. Are any of the following used by the school in the teaching of reading?

(a)	Initial Teaching Alphabet	
(b)	Colour coded schemes	
(c)	Diacritical marking	
(d)	Key words reading scheme (e.g. Ladybird)	*V S P*
(e)	Other controlled vocabulary (e.g. Janet & John)	*T S P*
(f)	Breakthrough to Literacy	
(g)	Reading laboratories	*V*

2. Are any of the following approaches used? (If more than one, please tick as many as necessary, but indicate the main method, if any.)

(a)	Alphabetic analysis (letter names)	*T*
(b)	Look and Say (word recognition)	*T S*P**
(c)	Phonic 1 (letter sounds, diphthongs)	*V*T*S P*
(d)	Phonic 2 (based on syllables)	*V T S P*
(e)	Sentence method	

3. Graded reading schemes. Does reading practice rely on?

(a)	One single, commercially produced, grading reading scheme	*T*
(b)	A mixture of books arranged in order by the school, and drawing from more than one commercially produced scheme and/or books not in set schemes.	*V S P*

4. Are the children expected to read from their reading scheme books?

(a)	Daily	*V T S P*
(b)	3 or 4 times weekly	
(c)	1 or 2 times weekly	
(d)	Less often	

5. Is it usual for the children to read supplementary readers between the major steps of the graded series?

(a)	Yes	*V T S*
(b)	No	*P*

6. Are the children usually tested by the teacher before they move from one book to the next?

(a)	Yes	*V T S P*
(b)	No	

7. Do some poor readers ever have to repeat a book?

(a)	More than once	
(b)	Once	*T*
(c)	Never	*V S P*

8. May children borrow, for their individual use in school, books from collections:

(a)	In the classroom	*V T S P*
(b)	Elsewhere in the school, (library etc.)	*V T S P*

9. Are children allowed to take any books for use at home?

(a)	Reading scheme book	*V T S*
(b)	Supplementary reader	*V T S*
(c)	School library books	*V T S P*

10. If other than school library book to (9) above, how often are books allowed to be taken home?

(a)	As often as child wishes	*V T S*
(b)	More than once a week	
(c)	About once a week	
(d)	Occasionally only, e.g., when moving up a book in a graded scheme.	

11. Are parents encouraged:

(a)	To read to their children	*V T*
(b)	To listen to their children read	*V T S*
(c)	Not to try to help their children at home, in case it confuses them	*P*

12. In a typical school day, how much time would a child usually spend on individual reading, excluding reading practice?

(a)	0 minutes	
(b)	5-10 minutes	
(c)	10-20 minutes	*T S P*
(d)	More than 20 minutes (Estimate?)	*V*

13. In a typical school day, how much time would a child usually spend on Reading Practice (graded and supplementary readers, phonic practice etc.)?

(a)	0 minutes	
(b)	5-10 minutes	
(c)	10-20 minutes	*T S P*
(d)	More than 20 minutes (Estimate?)	*V*

14. At the present time, are any children receiving special help in reading?

(a)	Yes	V T S P
(b)	No	

15. If 'Yes' to (14) above, what form does this special help take?

(a)	Extra time from class teacher - individually	P
	- in groups	P
(b)	Part time help from a remedial teacher - individually	V T P
	- in groups	V T S P
(c)	Poorest readers put together in one class - i.e. a modified form of streaming.	P

The Schools' Questionnaire - summary of similarities and differences between schools.

Infants Schools

Items 1 - 3 Children from all four schools had been taught to read by very similar methods: all the schools used controlled vocabulary reading schemes, and a mixture of phonic and 'look and say' methods of instruction. Only School S relied on books from a single reading scheme; the other three schools combined books from more than one scheme.

Item 4 Children in all four schools were expected to read from their scheme book at least 3 or 4 times per week.

Items 5 - 7 Supplementary readers were used between steps of the graded series in all schools except School V. In all schools, children were tested by their teacher before moving up a stage in the reading scheme; and no school made a child repeat a book more than once.

Items 8 - 10 All schools had a collection of library books which children could borrow for their use in school, and three schools (not School S) allowed library books to be taken home. Schools S, T and P allowed reading scheme and supplementary readers to be taken home, but the frequency of this activity varied from school to school.

Item 11 According to the head teacher reports, parents of children in all four schools were encouraged to read to their children: in three schools, (not School V), parents were also encouraged to listen to their children read.

Items 12-13 In a typical school day, the time spent on individual reading (excluding reading practice) varied from school to school, as did the time spent on formal reading practice itself. The head of School T did not supply 'typical' figures, because the time spent was said to vary greatly from child to child.

Items 14-15 In all schools except School S, some children were receiving special help with reading in the last term of the infants school, either from the class teacher (Schools T and P) or from a remedial teacher. (School V)

The Schools' Questionnnaire - summary of similarities and differences between schools..... cont....

Junior Schools

Items 1 - 3 The method of teaching reading employed in the junior schools was very similar to that in the infants schools - controlled vocabulary, commercially produced, scheme readers, and a mixture of phonic and 'look and say' methods of instruction (except School V, which relied on phonic methods.) Only School T relied on books from a single reading scheme.

Item 4 Children in all four schools were expected to read from their scheme books daily.

Item 5 - 7 Supplementary readers were used between the steps of the graded scheme in all schools except School P. In all schools, children were 'tested' by their teacher before moving up a stage in the reading scheme: in School T some children repeated a book once; in the other three schools, children were said never to repeat books.

Items 8 - 10 All four schools had both classroom and library collections of books for children's use in school. Children took library books home in all four schools: in addition, Schools V, T and S allowed both reading scheme and supplementary readers to be taken home as often as the children wished.

Item 11 Parents of children in Schools V and T were encouraged to read to their children, and in Schools V, T and S to listen to their children read. In School P, parents were not encouraged to help their children at home.

Items 12 - 13 Schools T, S and P reported that children spent 10-20 mins. per day on non-scheme reading, and the same amount of time on formal reading practice. In School V, children were said to spend more than 20 minutes a day on each of these activities.

Items 14-15 In all four schools, some children were receiving special help with reading, a remedial teaching being the main source of help in all cases.

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